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ABSTRACT

Statistical data on many aspects of dental and allied dental personnel supply, distribution, characteristics, and education and on certain other aspects of dental services are presented and discussed. The data on dentist supply show the national trend in the supply of active dentists since 1950 and the concurrent changes in dentist-to-population ratios, as well as increases in the number of dentists in each specialty and State and region. The geographic maldistribution of dentists is examined. Data are presented on dental practice characteristics, including type of dental employment, employment of dental auxiliary personnel, number of patient visits, and income. Trends in the number of dental schools, student enrollment, and graduates are discussed and documented. Data are presented on the supply of allied dental personnel, including dental hygienists, dental assistants, and dental laboratory technicians, and on the availability of training programs for these types of personnel. The utilization of dental services by the public is explored in terms of the percent of persons who have visited a dentist within a year, the average number of dental visits, and the types of services received. Trend data are presented on national health expenditures and dental expenditures from 1950 through 1970. Insurance coverage for dental care is discussed. Data are presented on the oral health status of the U.S. population, as indicated by the number of decayed, missing, and filled teeth; the extent of periodontal disease; and the prevalence of edentulous arches. A statistical summary of the 1975 flouridation census is also included. (SC)

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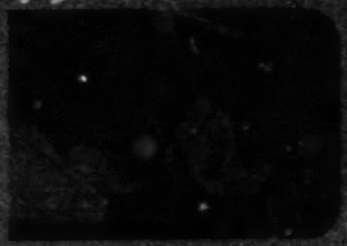

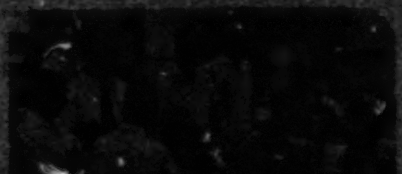

dental manpower fact book

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CONTENTS

	Page
Introduction	1
List of Tables	5
A. Dentist Supply	11
B. Geographic Maldistribution of Dentists	25
C. Dental Practice Characteristics	31
D. Dental Education	43
E. Allied Dental Personnel Supply	63
F. Education of Allied Dental Personnel	72
G. Utilization of Dental Services	83
H. Dental and Medical Expenditures	93
I. Oral Health Status	101

INTRODUCTION

This Dental Manpower Fact Book is a collection of statistical tables, with supporting text, on many aspects of dental and allied dental manpower supply, distribution, characteristics, and education, and on certain other aspects of dental services. Most of the data were available heretofore in widely scattered places, and some of the data were previously unpublished. The Fact Book presents data developed by a number of organizations, including the American Dental Association, the National Center for Health Statistics, and the Division of Dentistry of the Bureau of Health Manpower, as indicated in the sources given on the individual tables.

This Fact Book has been prepared as a ready working reference on dental manpower and related dental subjects to meet the needs of health planners, administrators, educators, investigators, individual dentists and dental auxiliaries, students, and others.

The publication in hand is the first edition of the Dental Manpower Fact Book prepared for general distribution. It was preceded by a loose-leaf version, which was initially prepared to meet internal reference needs of the Bureau of Health Manpower. It was first distributed in 1976 to a very limited group of administrators and research personnel directly involved with dental manpower responsibilities. Subsequently, updated replacement pages or sections were occasionally made available. This version of the Fact Book was a bulky document which did not lend itself to reproduction and broad usage.

The loose-leaf Fact Book attracted considerable attention and generated requests for copies beyond the number which it was feasible to supply. Because of the interest shown and the apparent need for the information presented, it was decided to prepare a different version suitable for a wider audience. To this end, the Fact Book was modified by elimination of some material, simplification of a number of tables, and addition of supporting text for the tables presented. It is hoped that users will find the present Fact Book, with its presentation of many basic statistics, to be a convenient and useful document.

The data are organized in nine major sections, labeled from Section A through Section I.

Section A presents statistics to show the national trend in the supply of active dentists since 1950 and the concurrent changes in dentist-to-population ratios. Also shown is the increase from 1960 to 1977 in the number of dentists in each specialty. Presented by regions and individual States is the 1977 supply of dentists and, separately, of dentists in each specialty, as well as the dentist-to-population ratios. Also given is the age distribution of dentists in 1977.

Data are provided to show what proportion of the 1976 supply of dentists in each State were graduated from dental schools in the same State, in another State in the same region, or in a different region.

Selected aspects of dental licensing in 1977 are presented, including State participation in regional clinical licensure tests, State recognition of licenses issued by other States, and State licensure of foreign dental graduates.

National projections are given of the year-by-year supply of dentists, together with the annual additions and losses to the supply, from the present to 1990.

Section B compares the availability of dentists in metropolitan and non-metropolitan areas, as indicated by persons-per-dentist ratios, patient waiting time, and the degree of dental practice busyness. Also shown is the State-by-State distribution of counties grouped according to the ratio of persons per dentist.

Section C provides data on the distribution of active dentists by primary type of dental employment (e.g., dental practice, teaching, military), and on the average percent of time spent on different dental care procedures.

Trend data, beginning with 1955, are given on the percent of dentists who employ auxiliaries. Data are given on the average number of patient visits per week for various age groups of dentists and for dentists with different numbers of auxiliaries. Trend data are provided since 1964 on the percent distribution of dentists according to four levels of practice busyness.

Data are presented on the trend since 1964 in average gross and net income for general practitioners and specialists, and on the variations in average income of dentists in 1976, by age group. Also included in this Section are average professional expenses of dentists since 1970, with a breakdown by specific items of expense (e.g., salaries, rent, insurance).

Section D begins with a presentation of the trend in the number of dental schools, total and first-year students, and graduates since academic year 1950-51, and the trend since 1960-61 in the number of dental applicants and the percent of applicants enrolled. The new dental schools established since 1950 are identified, and the number of students and graduates of the 59 individual dental schools in 1977 are given. Projections are made for the annual number of dental students and graduates through academic year 1989-90.

Data are presented to show the proportion of the graduates of each individual dental school who were located in the State of graduation, in another State in the same region, or in a different region, as of 1976.

Data are given for first-year enrollment of both minority and female students in dental schools during the present decade, and also for enrollment of minorities and females in academic year 1977-78, by class year.

Data are provided on the number of graduates of dental general practice residencies and dental specialty programs since 1973, and also on the number of students and graduates in 1977 for both types of advanced dental education.

This section ends with financial data for students and for schools. Average first-year tuition costs and other educational costs of students in both public and private dental schools are presented for academic years 1971-72 through 1977-78. Trend data for 1967-68 through 1976-77 are given for the average annual costs of public and private schools per dental student, by school size.

Section E shows the national trends from 1950 through 1977 in the number of active dental hygienists, dental assistants, and dental laboratory technicians, together with concurrent changes in the number of each type of auxiliary per 100 dentists. The same information is given for each category of auxiliary by State and other geographic areas for 1977.

Section F presents data showing national trends in the growth of training programs for the three categories of dental auxiliaries--hygienists, assistants, and laboratory technicians. The number of programs, total and first-year students, and graduates are given for each type of auxiliary, beginning with academic year 1950-51 for dental hygienists, and with 1965-66 for the other two auxiliaries. Also given are State-by-State data on the number of programs, students, and graduates for each type of auxiliary program in 1977. Data are provided on the number of applicants for each type of dental auxiliary program and the percent actually offered admission, as well as certain trend data on enrollment of minority students.

Section G focuses on the extent to which dental services are utilized by the public, expressed in terms of the percent of persons who have visited a dentist within a year and the average number of dental visits per person per year. Trend data are presented on such utilization between 1964 and 1977; other data show the variations in 1977 in utilization by selected demographic characteristics, e.g., age and income. The data also show a direct relationship between the persons-per-dentist ratio of various geographic areas and the extent to which the population of those areas use dental services.

Trend data are given for the years 1964 and 1971 on the percent distribution of dental visits by the type of services provided to the patient, e.g., cleaning teeth and fillings. Data are also provided on the distribution of 1971 dental visits by type of service, as these varied by sex and age group.

Section H provides trend data from 1950 through 1970 on national health expenditures and dental expenditures, including their percentage of the gross national product (GNP). Trend data for the same time period show

the national per capita expenditures for various health services, including dentists' services, physicians' services, and hospital care. Dentists' fees and other health-cost components of the consumer price index from 1967 through 1977 are related to the overall consumer price index. Statistics indicate the increase in the percent of the population covered by dental care plans from 1965 through 1976 and the increase in expenditures for dental care by private health insurance organizations since 1970.

Section I presents data for 1971-1974 on the oral health status of the U.S. population, as indicated by the number of decayed, missing, and filled teeth (the DMF index), the extent of periodontal disease, and the prevalence of edentulous arches. The statistical summary of the 1975 fluoridation census shows the percent of the U.S. population, by individual States, which is served by water with adequate fluoride content, whether occurring naturally or adjusted by the community.

There follows a List of Tables, grouped according to the nine Sections of this publication. Then follows the main part of the Fact Book--Section by Section--with each group of tables preceded by a narrative description for every table.

LIST OF TABLES

A. Dentist Supply

Table No.		Page
A-1.	Number of Active Dentists and Dentist-to-Population Ratios: Selected Years, December 31, 1950-1977	15
A-2.	Number of Active Dentists, by Age Group: December 31, 1977	16
A-3.	Number of Active Civilian Dentists and Dentist-to-Population Ratios, by Region, Division, and State: December 31, 1977	17
A-4.	State Where Dentist was Located in 1976, in Relation to Location of Dental School from Which Graduated	18
A-5.	Number of Dental Specialists: 1960, 1970, and 1977	19
A-6.	Number of Dental Specialists, for Each Specialty, and Specialist-to-Population Ratios, by Region, Division, and State: December 31, 1977	20
A-7.	States Participating in Regional Clinical Dental Licensure Testing: 1977	21
A-8.	States Which Recognize Dental Licenses Issued by Other States: 1977	22
A-9.	Foreign Dental Graduates Licensed in the United States, by State, Through 1977	23
A-10.	Annual Additions and Losses to the Supply of Active Dentists: Actual 1977, and Projected 1978 Through 1990	24

B. Geographic Maldistribution of Dentists

B-1.	Ratio of Persons per Active Civilian Dentist in Metropolitan Areas and Non-Metropolitan Counties, by Region, Division, and State: 1976	27
B-2.	Distribution of Counties According to Ratio of Persons per Active Civilian Dentist, by State: 1976	28

B. Geographic Maldistribution of Dentists - Continued

Table No.		Page
B-3.	Percent Distribution of Independent Dentists by Average Waiting Time for Initial Appointment, by Size of City: 1975	29
B-4.	Percent Distribution of Independent Dentists According to Practice Busyness, by Size of City: 1975	30

C. Dental Practice Characteristics

C-1.	Number of Active Dentists, by Primary Type of Dental Employment: December 31, 1977	34
C-2.	Average Percent of Time Spent per Week on Various Procedures by Independent Dentists, by Type of Procedure: 1975	35
C-3.	Percent of Independent Dentists Who Employ Auxiliaries: Selected Years 1955-1975	36
C-4.	Average Number of Patient Visits per Week by Dentists in General Practice, with Different Numbers of Auxiliaries, Related to Age Group of Dentist: 1967-1970	37
C-5.	Number of Patient Visits per Week of Independent Dentists Practicing Alone, by Age Group: 1977	38
C-6.	Percent Distribution of Independent Dentists According to Practice Busyness: Selected Years 1954-1977	39
C-7.	Average Income of Independent Dentists, by General and Specialty Practice: Selected Years 1964-1976	40
C-8.	Average Income of Independent Dentists Practicing Alone, by Age Group: 1976	41
C-9.	Average Professional Expenses of Independent Dentists, by Type of Expense: Selected Years 1970-1976	42

D. Dental Education

D-1.	Number of Dental Schools, Students, and Graduates: Selected Academic Years 1950-51 Through 1977-78	49

Table No.		Page
D-2.	Number of Dental School Applicants in Relation to Number of First-Year Dental Students: Academic Years 1960-61 Through 1977-78	50
D-3.	Number of Students and Graduates of Individual Dental Schools, by State: 1977	51
D-4.	New Dental Schools Since 1950 and Academic Year of Enrollment of First Class	52
D-5.	Actual and Projected Numbers of Students and Graduates of Dental Schools, by 4-Year and 3-Year Programs: Academic Years 1975-76 Through 1989-90	53
D-6.	Dental School From Which Dentist Graduated, in Relation to Dentist Location in 1976	54
D-7.	Minority Students in First Year of Dental School: Academic Years 1971-72 Through 1977-78	55
D-8.	Minority Students in Dental Schools in 1977-78, by Class Year, and 1977 Minority Graduates	56
D-9.	First-Year Students in Dental Schools, by Sex: Academic Years 1970-71 Through 1977-78	57
D-10.	Female Students in Dental Schools, by Class Year: Academic Year 1977-78	58
D-11.	Graduates of Dental General Practice Residencies and Dental Specialty Programs: 1973-1977	59
D-12.	Students and Graduates in Dental General Practice Residencies and Dental Specialty Programs: 1977	60
D-13.	Average First-Year Tuition and Average Total First-Year Educational Costs for Resident and Non-Resident Dental Students, by Public and Private Schools: Academic Years 1971-72 Through 1977-78	61
D-14.	Average Annual Cost to Public and Private Dental Schools per Dental Student, by School Size: Academic Years 1967-68 Through 1976-77	62

E. Allied Dental Personnel Supply

Table No.		Page
E-1.	Estimated Number of Active Dental Hygienists and Number per 100 Active Dentists: Selected Years 1950-1977 ...	65
E-2.	Estimated Number of Active Dental Hygienists and Number per 100 Active Civilian Dentists, by Region, Division, and State: December 31, 1977	66
E-3.	Number and Percent of Dental Hygienist Graduates Active as Hygienists, by Age Group: December 31, 1977	67
E-4.	Estimated Number of Active Dental Assistants and Number per 100 Active Dentists: Selected Years 1950-1977 ...	68
E-5.	Estimated Number of Active Dental Assistants and Number per 100 Active Civilian Dentists, by Region, Division, and State: December 31, 1977	69
E-6.	Estimated Number of Active Dental Laboratory Technicians and Number per 100 Active Dentists: Selected Years 1950-1977	70
E-7.	Estimated Number of Active Dental Laboratory Technicians and Number per 100 Active Civilian Dentists, by Type of Workplace and by Region, Division, and State: December 31, 1977	71

F. Education of Allied Dental Personnel

F-1.	Number of Dental Hygienist Training Programs, Students, and Graduates: Selected Academic Years 1950-51 Through 1977-78	75
F-2.	Number of Dental Hygienist Training Programs, Students, and Graduates, by State: 1977	76
F-3.	Number of Dental Assistant Training Programs, Students, and Graduates: Academic Years 1965-66 Through 1977-78	77
F-4.	Number of Dental Assistant Training Programs, Students, and Graduates, by State: 1977	78
F-5.	Number of Dental Laboratory Technician Training Programs, Students, and Graduates: Academic Years 1965-66 Through 1977-78	79

F. Education of Allied Dental Personnel - Continued

Table No.		Page
F-6.	Number of Dental Laboratory Technician Training Programs, Students, and Graduates, by State: 1977	80
F-7.	Minority Students in First Year of Dental Auxiliary Training Programs: Academic Years 1972-73 Through 1977-78	81
F-8.	Number of Applicants and Number and Percent Offered Admission, by Type of Dental Auxiliary Training Program: Academic Year 1976-77	82

G. Utilization of Dental Services

G-1.	Percent of Persons with One or More Dental Visits Within a Year and Average Number of Dental Visits per Person per Year: 1963-64 and 1969 Through 1977	86
G-2.	Percent of Persons with One or More Dental Visits Within a Year and Average Number of Dental Visits per Person per Year, by Demographic Characteristics: 1977	87
G-3.	Persons-per-Dentist Ratios, by Geographic Region and Place of Residence, Related to Dental Visits	88
G-4.	Persons-per-Dentist Ratios, by State Group, Related to Dental Visits	89
G-5.	Percent of Persons with One or More Dental Visits Within a Year and Average Number of Dental Visits per Person per Year, by State: 1969-1971	90
G-6.	Percent Distribution of Dental Visits by Type of Service Provided to Patients: 1963-64 and 1971	91
G-7.	Percent Distribution of Dental Visits by Type of Service Provided to Patients, by Sex and Age Group: 1971	92

H. Dental and Medical Expenditures

H-1.	National Health Expenditures and Dental Expenditures, by Total Amount and as Percent of Gross National Product: Selected Fiscal Years 1950-1977	95

H. Dental and Medical Expenditures - Continued

Table No.		Page
H-2.	National Health Expenditures, by Type of Service and by Private and Public Expenditure: Fiscal Year 1977	96
H-3.	National Per Capita Health Expenditures, by Selected Type of Service: Selected Fiscal Years 1950-1977	97
H-4.	U.S. Annual Average Consumer Price Index for Selected Health Care Items: 1967 Through 1977	98
H-5.	Estimated Number of Beneficiaries Under Private Dental Care Plans and Percent of Civilian Population Covered: 1965 Through 1976	99
H-6.	Estimated Expenditures of Private Health Insurance Organizations for Dental Care: 1970 Through 1976	100

I. Oral Health Status

I-1.	Number of Decayed, Missing, and Filled (DMF) Permanent Teeth per Person, by Sex, Color, and Age Group: 1971-1974	103
I-2.	Percent Distribution of Adults by Status of Periodontal Disease, According to Sex and Age Group: 1971-1974	104
I-3.	Percent Distribution of Adults by Number of Edentulous Arches, According to Sex and Age Group: 1971-1974	105
I-4.	Percent of Population Served with Adjusted and Natural Fluoridated Water Supplies, by State: December 31, 1975	106

A. DENTIST SUPPLY

Past and Current Supply of Dentists

At the end of 1977, there were approximately 117,890 active dentists in the United States, of whom 112,720 were civilian dentists and 5,170 were dentists in the Armed Forces (Table A-1.) In 1950 there were some 75,000 active civilian dentists, providing a ratio of 49.8 dentists per 100,000 population. The supply of dentists increased steadily in subsequent years, but the increase in population was proportionately greater, resulting in a gradual decline in the dentist-to-population ratio until, in 1965, it reached a low of 46.5 dentists per 100,000 population. After 1965, the unfavorable trend was reversed and the ratio slowly increased until, by the end of 1977, the dentist-to-population ratio was 52.3 per 100,000, somewhat higher than the level in 1950.

In 1977, the median age of active dentists was 41.5 years. This figure is slightly lower than the comparable figure for earlier years of this decade, primarily because of the increase in the number of dental graduates. Almost one-third (38,260) of the active dentists are under 35 years of age, including 17 percent who are under 30 years of age (Table A-2). About one-fifth of the active dentists are 55 years of age or over, including 9 percent (10,180) who are age 65 or older.

There are great variations in dentist-to-population ratios among the regions and among the States. In 1977, the Northeast and the West had the highest dentist-to-population ratios among the regions, with respectively 64 and 63 active civilian dentists per 100,000 population; the South had the lowest ratio with 42 (Table A-3). (These ratios are computed on the basis of mid-year population, which accounts for a national dentist-to-population ratio of 53 per 100,000, rather than the 52 per 100,000 in Table A-1.) New York had the highest ratio of any individual State--76 dentists per 100,000 population. Five other States had ratios of 65 or more--Oregon, Hawaii, Washington, Massachusetts, and California. Mississippi had the lowest ratio, with 30.

Black Dentist Supply

In 1970, employed black dentists numbered 2,098, somewhat more than 2 percent of all employed dentists, according to the U.S. Bureau of the Census. In 1950 there were 1,681 employed black dentists, constituting virtually the same proportion of all employed dentists as in 1970.

Dentist's Location Related to Dental School Location

Table A-4 shows the 1976 location of the existing supply of civilian dentists active in each State and relates that information to the geographic area of graduation. On a national basis, some 56 percent

of dental graduates are located in the same State where they graduated. As might be expected, there are a considerable number of States where a very high proportion of the dentists graduated from the State's own dental schools. In 14 States, 75 percent or more of the dentists graduated from dental schools in those States. Indeed, in Pennsylvania, Nebraska, Minnesota, Missouri, and Tennessee, more than 85 percent of the active dentists in each State graduated from dental schools within the respective States.

On a national basis, 22 percent of active civilian dentists located in a State other than where they graduated, but still within the region of graduation (i.e., Northeast, North Central, South, or West). Another 22 percent of active dentists located in some region other than where they graduated. For some individual States, however, the percent figures for graduation of their dentists, either elsewhere within the same region or in some other region, were much higher than the national average. For example, in four States--Kansas, North and South Dakota, and Mississippi--over 85 percent of the dentists were graduated from a dental school located elsewhere in the same region. New Mexico and Colorado each had over 90 percent of their active dentists graduated from schools outside of their region.

Dental Specialists

The American Dental Association (ADA) formally recognizes eight areas of dental practice as constituting specialty practice. The number of all dental specialists increased from 4,170 in 1960 to 15,465 in 1977, approaching a four-fold increase, which is a much higher proportional increase than that for the total dental work force (Table A-5). Nevertheless, the dental specialists practicing in 1977 constituted only 14 percent of the Nation's active civilian dentists. In 1977, two-fifths of all dental specialists, or over 6,000, limited their practice to orthodontics. The next largest group, some 3,600, specialized in oral surgery. Periodontists comprised the third largest specialty group with some 1,900 dentists, followed very closely by pedodontists with over 1,800. Dentists in the other four specialities--endodontics, prosthodontics, oral pathology, and public health dentistry--numbered 1,870, or about 13 percent of all specialists.

In 1977, the United States had 7.2 active dental specialists per 100,000 civilian population (Table A-6). By geographic division, the Pacific States and New England were virtually equal in having the best supply of dental specialists, with respectively 9.8 and 9.7 specialists per 100,000 population. The East South Central division had the lowest ratio, with 5.0 specialists per 100,000 population. Among the individual States, Connecticut had the highest ratio of 11.0 per 100,000, followed in order by Massachusetts, Maryland, Washington, California, and Colorado, each with a ratio of more than 10.0 specialists per 100,000 population. At the other end of the spectrum, four States had a ratio of less than 4.0 dental specialists per 100,000 population.

Dental Licensure

Dentists are licensed by every State and the District of Columbia and each requires every applicant for licensure to pass both a written and a clinical examination. In all States, except Alabama and Delaware, applicants for licensure may entirely or partially meet their State's written examination requirement by passing a written examination administered by the National Board of Dental Examiners of the American Dental Association. The clinical examinations for dental licensure may be administered by the boards of dentistry of the individual States or by regional licensure testing boards, of which 32 States and the District of Columbia are now members (Table A-7). These regional boards conduct simultaneous clinical examinations at locations in one or more of the participating States. By passing such an examination, candidates satisfy the clinical examination requirement of each participating State. There are now four such regional arrangements: the North East Regional Board, with a membership of 14 States and the District of Columbia; the Central Regional Dental Testing Service, with 11 States; the Southern Regional Testing Agency, with four States; and the recently-organized Western Regional Examining Board, with three States.

In some States, dentists who apply for licensure may have the dental license they already hold in another State formally recognized as a qualification for licensure in the new or additional State in which they seek to practice. When such out-of-State licenses are recognized or accepted, this is usually accomplished either through evaluation and acceptance of the credentials of the applicant or through inter-State agreements for the recognition of licenses issued by specific States (Table A-8). Licensure by credentials--a procedure adopted in some form by 19 jurisdictions--is the granting of a dental license to dentists currently licensed in another State, without examination, and on the basis of their credentials meeting the professional criteria established by the State board of dentistry to which they have applied for licensure. (Such credentials may be, for example, a minimum number of years of practice experience and an ethical reputation.) There are only a few States with inter-State arrangements for recognition of dental licenses issued by one or more specifically-identified jurisdictions.

The graduates of foreign dental schools have never been a significant factor in the Nation's supply of dentists, in contrast to the large number of physicians in the United States who graduated from foreign medical schools. Only 13 States and the District of Columbia recognize dental degrees earned outside the United States and Canada. It is estimated that, between 1970 and 1977, only 959 foreign dental graduates (FDG's) were licensed to practice in the United States, and three-fourths were licensed by just two States--California and New York (Table A-9).

Projections of Dentist Supply

Year-by-year projections of the numbers of active dentists (civilian plus military dentists) indicate a steady annual increase from 1977 through 1990. The number of 117,690 active dentists in 1977 is projected to increase to 126,240 by 1980, to 140,740 by 1985, and to 154,510 by the end of 1990--an increase of about 36,600, or 31 percent above the number in 1977 (Table A-10). The expected supply of 154,510 active dentists in 1990 is based on the assumption that there will be only a slight increase from the 5,140 graduates in 1977 to 5,400 graduates in 1982 (excluding Puerto Rico), and that this level will be maintained thereafter through 1990. By the end of the projection period, the net gain in the number of active dentists is accounted for by the entry of about 69,400 dental graduates, offset by the loss of about 32,800 active dentists through death and retirement.

The projection of a large increase in the number of dentists in the years ahead, combined with an expected fairly steady rate of population growth, results in a significant improvement in dentist-to-population ratios. The national ratio of 52 active civilian dentists per 100,000 civilian population in 1977 is projected to increase considerably to 62 in 1990, surpassing the previous most favorable ratio of 58, which was recorded in 1930.

Table A-1
NUMBER OF ACTIVE DENTISTS AND DENTIST-TO-POPULATION RATIOS:
SELECTED YEARS, DECEMBER 31, 1950-1977

Year	Total active dentists 1/	Active civilian dentists	Civilian population (thousands)	Active civilian dentists per 100,000 civilian population	Persons per active civilian dentist
1950	79,190	75,310	151,238	49.8	2,008
1955	84,370	78,270	164,597	47.6	2,103
1960	90,120	84,500	179,780	47.0	2,127
1965	95,990	89,640	192,951	46.5	2,149
1970	102,220	95,680	203,109	47.1	2,123
1975	112,020	106,740	212,296	50.3	1,990
1976	115,000	110,000	213,865	51.4	1,944
1977	117,890	112,720	215,620	52.3	1,912

1/ Includes military dentists.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Economic Research and Statistics.

U.S. Bureau of the Census. Current Population Reports P-25, Nos. 439 and 719.

Table A-2
NUMBER OF ACTIVE DENTISTS, BY AGE GROUP:
DECEMBER 31, 1977 1/

Age group	Active dentists	
	Number	Percent
All ages	117,890	100.0
Less than 35 years	38,260	32.4
Under 25 years	4,150	3.5
25-29 years	15,700	13.3
30-34 years	18,410	15.6
35-54 years	54,740	46.5
35-39 years	16,370	13.9
40-44 years	14,740	12.5
45-49 years	11,180	9.5
50-54 years	12,450	10.6
55 years and over	24,890	21.1
55-59 years	9,420	8.0
60-64 years	5,290	4.5
65-69 years	3,690	3.1
70-74 years	3,210	2.7
75 and over	3,280	2.8

1/ Includes military dentists.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table A-3

NUMBER OF ACTIVE CIVILIAN DENTISTS AND DENTIST-TO-POPULATION RATIOS, BY REGION, DIVISION, AND STATE: DECEMBER 31, 1977

Geographic area	Active civilian dentists	Civilian population July 1, 1977 (thousands) 1/	Dentists per 100,000 civilian population	Persons per dentist
UNITED STATES	112,720	214,685	53	1,905
NORTHEAST	31,478	49,171	64	1,562
New England	7,384	12,198	61	1,652
Connecticut	1,929	3,094	62	1,604
Maine	451	1,075	42	2,384
Massachusetts	3,840	5,770	67	1,503
New Hampshire	441	845	52	1,916
Rhode Island	458	930	49	2,031
Vermont	265	483	55	1,823
Middle Atlantic	24,094	36,974	65	1,535
New Jersey	4,350	7,301	60	1,678
New York	13,542	17,898	76	1,322
Pennsylvania	6,202	11,775	53	1,899
NORTH CENTRAL	28,150	57,781	49	2,053
East North Central	19,806	40,981	48	2,069
Illinois	5,819	11,205	52	1,926
Indiana	2,075	5,322	39	2,565
Michigan	4,463	9,116	49	2,043
Ohio	4,893	10,689	46	2,185
Wisconsin	2,556	4,650	55	1,819
West North Central	8,344	16,799	50	2,013
Iowa	1,256	2,878	44	2,291
Kansas	1,020	2,299	44	2,254
Minnesota	2,378	3,972	60	1,670
Missouri	2,226	4,777	47	2,146
Nebraska	874	1,549	56	1,772
North Dakota	295	641	46	2,173
South Dakota	295	683	43	2,315
SOUTH	28,803	69,004	42	2,396
South Atlantic	15,102	33,783	45	2,237
Delaware	251	377	66	1,502
District of Columbia	655	682	96	1,041
Florida	3,911	8,358	47	2,137
Georgia	1,932	4,988	39	2,582
Maryland	2,338	4,095	57	1,751
North Carolina	1,976	5,430	36	2,748
South Carolina	1,026	2,807	37	2,736
Virginia	2,376	4,987	48	2,099
West Virginia	637	1,859	34	2,918
East South Central	5,210	13,734	38	2,636
Alabama	1,179	3,666	32	3,109
Kentucky	1,352	3,422	40	2,531
Mississippi	715	2,368	30	3,312
Tennessee	1,964	4,277	46	2,178
West South Central	8,491	21,487	40	2,531
Arkansas	684	2,134	32	3,120
Louisiana	1,479	3,893	38	2,632
Oklahoma	1,082	2,780	39	2,569
Texas	5,246	12,681	41	2,417
WEST	24,289	38,730	63	1,595
Mountain	5,179	9,913	52	1,914
Arizona	1,082	2,270	48	2,098
Colorado	1,482	2,574	58	1,737
Idaho	421	852	49	2,024
Montana	407	755	54	1,855
Nevada	306	623	49	2,036
New Mexico	481	1,174	41	2,441
Utah	799	1,263	63	1,581
Wyoming	201	402	50	2,000
Pacific	19,110	28,818	66	1,508
Alaska	211	382	55	1,810
California	14,224	21,618	66	1,520
Hawaii	576	838	69	1,455
Oregon	1,643	2,373	69	1,444
Washington	2,456	3,606	68	1,468

1/ State population figures do not add to totals and subtotals due to independent rounding.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Economic Research and Statistics.

U.S. Bureau of the Census. Current Population Report P-25, No. 727.

TABLE A-4
STATE WHERE DENTIST WAS LOCATED IN 1976, IN RELATION TO LOCATION OF DENTAL SCHOOL FROM WHICH GRADUATED

State where dentist was located in 1976	Professionally-active civilian dentists graduated from U.S. dental schools			
	Number	Percent distribution by school location		
		School in same State as dentist's location	School in same region, but not same State as dentist's location	School in some region other than dentist's location
United States	102,408 1/	56.3	21.9	21.8
Alabama	1,138	62.0	31.0	7.0
Alaska	169	—	31.4	68.6
Arizona	1,011	—	26.0	74.0
Arkansas	651	—	62.2	37.8
California	12,104	62.7	3.0	34.3
Colorado	1,430	2.4	5.6	92.0
Connecticut	1,967	1.0	59.6	39.4
Delaware	242	—	21.5	78.5
District of Columbia	568	71.1	8.6	20.3
Florida	3,553	—	52.9	47.1
Georgia	1,840	62.0	22.0	16.0
Hawaii	497	—	20.3	79.7
Idaho	391	—	40.4	59.6
Illinois	5,201	79.6	15.3	5.1
Indiana	2,036	80.6	13.0	6.4
Iowa	1,263	76.3	20.8	2.9
Kansas	959	—	95.2	4.8
Kentucky	1,238	81.6	6.1	12.3
Louisiana	1,364	77.1	14.5	8.4
Maine	418	—	71.3	28.7
Maryland	2,073	51.8	28.2	20.0
Massachusetts	3,589	54.0	19.4	26.6
Michigan	4,381	83.3	11.6	5.1
Minnesota	2,229	88.2	9.6	2.2
Mississippi	647	—	92.0	8.0
Missouri	2,060	86.8	5.6	7.6
Montana	391	—	17.1	82.9
Nebraska	840	88.7	7.5	3.8
Nevada	281	—	37.4	62.6
New Hampshire	409	—	68.7	31.3
New Jersey	4,199	15.8	60.3	23.9
New Mexico	435	—	7.4	92.6
New York	11,208	59.5	23.1	17.4
North Carolina	1,816	43.9	42.6	13.5
North Dakota	257	—	87.2	12.8
Ohio	4,649	81.0	9.3	9.7
Oklahoma	1,003	—	32.9	67.1
Oregon	1,497	73.8	4.7	21.5
Pennsylvania	5,640	89.0	2.5	8.5
Rhode Island	444	—	57.4	42.6
South Carolina	887	16.7	70.0	13.3
South Dakota	277	—	93.5	6.5
Tennessee	1,761	86.2	8.5	5.3
Texas	4,870	78.4	7.9	13.7
Utah	734	—	34.9	65.1
Vermont	237	—	62.0	38.0
Virginia	2,096	56.2	26.9	16.9
Washington	2,287	46.5	23.6	29.9
West Virginia	620	31.5	35.6	32.9
Wisconsin	2,382	78.5	19.7	1.8
Wyoming	169	—	10.7	89.3

1/ Excludes some 7,600 dentists, among them all the 1976 graduates of U. S. dental schools, the graduates of foreign dental schools, and dentists whose school of graduation is unknown.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table A-5
NUMBER OF DENTAL SPECIALISTS: 1960, 1970, and 1977

Specialist	1960	1970	1977
All specialists	4,170	10,315	15,465
Orthodontists	2,097	4,335	6,185
Oral surgeons	1,183	2,406	3,628
Periodontists	307	1,003	1,946
Pedodontists	229	1,159	1,836
Endodontists	1/	497	920
Prosthodontists	278	715	774
Oral pathologists	42	97	91
Public health dentists	34	103	85

1/ Endodontics was not recognized as a dental specialty in 1960.

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. Facts About States for the Dentist Seeking a Location, 1961. Same publication for 1971. Unpublished 1977 data.

Table A-6
NUMBER OF DENTAL SPECIALISTS, FOR EACH SPECIALTY, AND SPECIALIST-TO-POPULATION RATIOS, BY REGION, DIVISION, AND STATE: DECEMBER 31, 1977

Geographic area	Number of Specialists									Specialists per 100,000 civilian population
	Ortho-dontists	Oral surgeons	Perio-dontists	Pedo-dontists	Endo-dontists	Prostho-dontists	Oral pathol-ogists	Public health dentists	All special-ists	
UNITED STATES	6,185	3,628	1,946	1,836	920	774	91	85	15,465	7.2
NORTHEAST	1,640	1,128	607	353	321	182	13	15	4,255	8.7
New England	457	305	196	113	82	53	-	4	1,119	7.7
Connecticut	191	83	60	27	18	10	-	1	380	11.0
Maine	25	17	5	2	3	1	-	-	53	4.9
Massachusetts	214	167	109	71	40	28	-	2	631	10.9
New Hampshire	23	15	6	3	1	-	-	-	48	5.7
Rhode Island	31	21	11	8	4	3	-	-	78	8.4
Vermont	13	5	5	2	1	1	-	-	27	5.4
Middle Atlantic	1,193	816	411	240	254	129	13	12	3,078	8.1
New Jersey	280	196	84	64	63	31	-	2	717	9.8
New York	644	390	241	99	140	84	11	7	1,616	9.0
Pennsylvania	269	232	86	77	52	24	2	3	745	6.3
NORTH CENTRAL	1,484	802	349	438	180	133	16	15	3,185	8.1
East North Central	1,015	600	248	291	132	85	13	11	2,597	8.3
Illinois	305	179	88	80	52	23	7	-	735	6.6
Indiana	110	81	28	51	15	7	-	-	292	5.5
Michigan	245	136	56	60	58	20	4	8	587	6.4
Ohio	252	144	61	63	28	17	2	3	570	5.3
Wisconsin	103	60	31	37	6	15	-	1	253	5.4
West North Central	469	202	85	147	48	48	3	2	888	8.1
Iowa	75	41	14	35	1	6	-	-	172	6.0
Kansas	57	32	16	23	7	9	1	-	145	6.3
Minnesota	110	41	24	27	8	6	-	1	219	5.5
Missouri	126	65	22	38	13	18	-	-	280	5.9
Nebraska	39	16	6	21	-	7	1	-	90	5.8
North Dakota	12	4	1	1	-	3	1	-	22	3.4
South Dakota	12	3	2	2	-	-	-	1	30	2.9
SOUTH	1,603	990	580	590	216	262	32	32	4,281	6.3
South Atlantic	833	558	383	260	137	165	25	25	2,386	7.3
Delaware	16	9	6	4	1	6	-	-	40	6.9
District of Columbia	17	20	13	8	2	9	8	1	77	11.3
Florida	240	160	128	79	55	39	2	5	704	8.4
Georgia	107	70	39	46	21	26	3	5	317	6.4
Maryland	138	95	40	32	31	38	13	14	430	10.5
North Carolina	108	56	29	38	11	11	3	2	269	5.0
South Carolina	57	30	29	19	5	11	1	1	153	5.5
Virginia	121	86	56	28	11	22	4	1	329	6.6
West Virginia	31	32	3	6	-	3	1	-	76	4.1
East South Central	259	173	67	111	35	31	3	3	682	5.0
Alabama	65	41	18	37	6	6	1	1	178	4.9
Kentucky	66	50	22	31	11	6	1	1	188	5.5
Mississippi	32	18	5	6	1	8	1	-	73	3.1
Tennessee	96	64	22	37	17	11	2	1	249	5.8
West South Central	511	259	130	163	44	71	9	5	1,138	5.6
Arkansas	35	17	8	14	2	3	-	-	81	3.8
Louisiana	80	52	15	40	4	3	1	1	196	5.0
Oklahoma	59	33	12	22	6	10	1	1	144	5.2
Texas	337	157	95	93	32	53	8	3	779	6.1
WEST	1,458	712	410	505	193	192	10	22	3,588	9.2
Mountain	329	188	85	97	22	40	1	3	755	7.0
Arizona	62	36	37	20	7	4	-	3	169	10.2
Colorado	105	55	36	41	7	15	1	-	263	9.0
Idaho	26	9	2	4	-	2	-	1	43	5.2
Montana	19	7	3	7	-	2	-	-	39	6.7
Nevada	19	5	5	9	2	2	-	-	42	6.0
New Mexico	30	16	7	9	2	3	-	3	70	6.0
Utah	58	12	4	6	4	1	-	1	86	6.8
Wyoming	10	4	1	1	-	-	-	-	16	4.0
Pacific	1,169	568	325	408	173	163	9	19	2,834	9.8
Alaska	8	6	3	-	1	2	-	-	22	5.8
California	902	452	243	324	135	127	7	7	2,197	10.2
Hawaii	31	8	11	6	6	6	-	-	68	8.1
Oregon	73	33	22	21	9	4	-	1	163	6.9
Washington	155	67	46	57	22	24	2	3	376	10.4

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. Unpublished 1977 data.

Table A-7
STATES PARTICIPATING IN REGIONAL CLINICAL
DENTAL LICENSURE TESTING: 1977

North East Regional Board (NERB)

The North East Regional Board, incorporated in 1969, has the following 15 members:

- Connecticut
- District of Columbia
- Illinois
- Maine
- Maryland
- Massachusetts
- Michigan
- New Hampshire
- New Jersey
- New York
- Ohio
- Pennsylvania
- Rhode Island
- Vermont
- West Virginia

Central Regional Dental Testing Service (CRDTS)

The Central Regional Dental Testing Service, incorporated in 1972, has the following 11 members:

- Colorado
- Iowa
- Kansas
- Minnesota
- Missouri
- Nebraska
- North Dakota
- Oklahoma
- South Dakota
- Wisconsin
- Wyoming

Southern Regional Testing Agency (SRTA)

The Southern Regional Testing Agency, incorporated in 1975, has the following four members:

- Arkansas
- Kentucky
- Tennessee
- Virginia

Western Regional Examining Board (WREB)

The Western Regional Examining Board, incorporated in 1976, has the following three members:

- Arizona
- Oregon
- Utah

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data supplied by individual regional testing organizations.

Table A-8
STATES WHICH RECOGNIZE DENTAL LICENSES ISSUED BY OTHER STATES: 1977

Licensure by Credentials

A number of jurisdictions have some provisions for licensing, without examination, dentists currently licensed in another State on the basis of their credentials (e.g., years of experience, ethical conduct). Those jurisdictions are:

Alaska	Minnesota	Puerto Rico
Indiana	Missouri	Rhode Island
Kansas	Nebraska	South Dakota
Maine	New York	Tennessee
Maryland	Ohio	Wyoming
Massachusetts	Oklahoma	
Michigan	Pennsylvania	

Recognition of Licenses of Specific States

Jurisdictions which recognize dental licenses issued by specific States are:

Jurisdiction recognizing licenses	Jurisdictions whose dental licenses are recognized
Illinois	Indiana, Iowa, Massachusetts, New Jersey, North Dakota, Pennsylvania, Rhode Island, and West Virginia
Massachusetts	District of Columbia, Illinois, Kansas, Maine, Minnesota, New York, Ohio, Pennsylvania, Rhode Island, and Tennessee
New Jersey	Illinois, Ohio, and Pennsylvania
Pennsylvania	Illinois, Indiana, Iowa, Massachusetts, and New Jersey
Puerto Rico	Illinois and Ohio
Rhode Island	Massachusetts

SOURCE: American Association of Dental Examiners, American Dental Association, and some individual State boards of dentistry.

Table A-9

FOREIGN DENTAL GRADUATES LICENSED IN THE UNITED STATES, BY STATE, THROUGH 1977 1/

State	Year State first allowed FDG's to be licensed	Number of FDG's licensed
Total		959
California	1970	425
District of Columbia	1971	2
Florida	1972	85
Illinois	1971	39
Maryland	1972	21
Massachusetts	1971	29
Michigan	1974	- 2/
Minnesota	1970	6
New York	1970	314
Oregon	1972 3/	1
Pennsylvania	1974	19
Tennessee	1972	7
Texas	1974	7
Washington	1975	4
Wisconsin	1975	0

1/ Does not include graduates of dental schools in Canada.

2/ Data are not available.

3/ Authorization for licensure of FDG's rescinded in 1976.

NOTE: In early 1978, New Jersey established authorization for licensure of FDG's and Massachusetts rescinded its authorization. Because these changes offset each other, there are still 14 jurisdictions with such authorization in effect.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data supplied by individual State boards of dentistry.

Table A-10

ANNUAL ADDITIONS AND LOSSES TO THE SUPPLY OF ACTIVE DENTISTS: ACTUAL 1977, AND PROJECTED 1978 THROUGH 1990 1/

Year	Number active January 1	Changes in supply January 1 - December 31			Number active December 31
		Graduate additions	Losses from deaths and retirements	Net gains	
1977	115,000	5,140	2,250	2,890	117,890
1978	117,890	5,060	2,330	2,730	120,620
1979	120,620	5,250	2,370	2,880	123,500
1980	123,500	5,150	2,410	2,740	126,240
1981	126,240	5,320	2,430	2,890	129,130
1982	129,130	5,400	2,450	2,950	132,080
1983	132,080	5,400	2,480	2,920	135,000
1984	135,000	5,400	2,520	2,880	137,880
1985	137,880	5,400	2,540	2,860	140,740
1986	140,740	5,400	2,570	2,830	143,570
1987	143,570	5,400	2,620	2,780	146,350
1988	146,350	5,400	2,630	2,770	149,120
1989	149,120	5,400	2,680	2,720	151,840
1990	151,840	5,400	2,730	2,670	154,510

1/ Includes military dentists; excludes dentists in Puerto Rico and graduates of the University of Puerto Rico.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

B. GEOGRAPHIC MALDISTRIBUTION OF DENTISTS

Major factors determining the location of dental practices are economic and social. In metropolitan areas there is generally a greater effective demand for dental services and a greater ability to pay for them than is the case in most non-metropolitan counties. As is the case with other health professionals, many dentists settle in or close to urban areas in order to be near centers of professional, educational, and cultural activities.

Ratio of Persons per Dentist in Different Areas

The metropolitan areas have nearly three times the population of the non-metropolitan counties but have over four times the number of dentists. Stated another way, the 73 percent of the population in metropolitan areas are served by 81 percent of the dentist work force.

There is a decided variance between the ratios of persons per dentist in metropolitan areas and non-metropolitan counties. The average number of persons per dentist in the Nation was 2,194 in 1976 (Table B-1). For metropolitan areas, the average number of persons per dentist was 1,981, although the ratios in inner-city portions of many metropolitan areas were much higher. For non-metropolitan counties the average was 3,137 persons per dentist.

In the non-metropolitan counties there is a steady decline in the concentration of dentists with each decrease in the size of the central city. For the non-metropolitan counties with the largest central cities (i.e., of 25,000 population and over), the average number of persons per dentist was 2,425. The ratio of persons per dentist continues to increase with the decreasing size of the central city until there is an average of 4,269 persons per dentist in counties with a central city of less than 5,000.

The variations at the national level in the ratios of persons per dentist between metropolitan areas and non-metropolitan counties generally persist when the data are examined by region and by division. Although there are various exceptions, the data also maintain the same general relationships within individual States.

The 3,114 counties of the United States show a very great variation in the persons-per-dentist ratios. There are 710 counties with the unfavorable ratio of 5,000 or more inhabitants per dentist, and an additional 267 counties with no dentist at all (Table B-2). At the other extreme, there are 373 counties with persons-per-dentist ratios less than 2,000 persons per dentist.

Patient Waiting Time

Large and small communities differ considerably with respect to the average length of time patients must wait before being scheduled to

receive dental treatment. As the size of a city or town decreases, the average patient waiting time for dental appointments increases. In 1975, in towns with populations under 2,500, 20 percent of the independent dentists scheduled patients for an average of a month or more in advance, compared to only 3 percent of the independent dentists in cities of over 1,000,000 (Table B-3). On the other hand, 21 percent of independent dentists in these largest cities scheduled patients within two days or less, on the average, while only 10 percent of independent dentists in towns under 2,500 accommodated patients as quickly.

Practice Busyness

Independent dentists in the smaller communities tended to have the heaviest practice loads and to categorize themselves as either overworked or too busy. Almost 48 percent of the dentists in the smallest communities were in these two categories in 1975--23 percent provided dental care to all patients who requested appointments but felt overworked (i.e., they were too rushed or were working too many hours or both), and another 25 percent were too busy to treat all persons who sought appointments (Table B-4). In contrast, only 24 percent of independent dentists in cities of more than 1,000,000 categorized themselves as either overworked or too busy. Nearly one-half of the independent dentists in the largest cities said that they had enough patients but not too many, while an additional 27 percent would have liked to have more patients.

Table B-1

RATIO OF PERSONS PER ACTIVE CIVILIAN DENTIST IN METROPOLITAN AREAS AND NON-METROPOLITAN COUNTIES, BY REGION, DIVISION, AND STATE: 1976 1/

Geographic area	Persons per active civilian dentist								
		Metropolitan areas, by population			Non-metropolitan counties, by size of central city				
	All areas	Total	1,000,000 or more	Under 1,000,000	Total	25,000 or more	10,000-24,999	5,000-9,999	Under 5,000
UNITED STATES	2,194	1,981	1,817	2,235	3,137	2,425	2,838	3,287	4,269
NORTHEAST	1,823	1,735	1,619	1,960	2,273	2,171	2,765	2,605	2,997
New England	1,778	1,682	1,528	1,791	2,348	2,075	2,498	1,996	2,522
Connecticut	1,650	1,601	—	1,601	2,085	3,558	2,595	—	—
Maine	2,323	1,794	—	1,794	2,992	2,661	3,357	3,017	2,621
Massachusetts	1,678	1,648	1,528	2,000	1,458	—	1,735	1,319	2,043
New Hampshire	2,006	1,751	—	1,751	2,138	1,931	2,550	1,929	1,754
Rhode Island	2,082	2,117	—	2,117	1,936	1,936	—	—	—
Vermont	1,968	—	—	—	1,968	1,565	1,759	2,274	2,707
Middle Atlantic	1,838	1,748	1,633	2,091	2,770	2,262	2,878	3,051	3,441
New Jersey	1,811	1,767	1,814	2,003	2,593	—	3,644	2,498	2,472
New York	1,663	1,589	1,502	2,034	2,585	2,131	2,936	2,867	3,682
Pennsylvania	2,215	2,082	2,085	2,234	3,014	2,581	2,922	3,427	3,857
NORTH CENTRAL	2,280	2,091	1,969	2,296	2,872	2,383	2,635	2,866	3,599
East North Central	2,286	2,140	2,001	2,382	2,958	2,524	2,776	3,036	3,800
Illinois	2,233	2,046	2,014	2,515	3,225	2,660	2,814	3,842	4,288
Indiana	2,750	2,504	2,222	2,668	3,446	2,657	3,400	3,730	4,889
Michigan	2,183	2,100	2,051	2,174	2,644	2,929	2,199	2,991	3,239
Ohio	2,392	2,240	1,982	2,546	3,285	2,788	3,129	3,563	4,025
Wisconsin	1,997	1,801	1,718	1,900	2,390	2,237	2,371	2,216	2,878
West North Central	2,264	1,928	1,860	2,034	2,779	2,205	2,489	2,679	3,480
Iowa	2,448	2,137	—	2,137	2,678	2,021	2,973	2,604	3,391
Kansas	2,545	2,171	1,852	2,450	2,976	2,842	2,772	2,511	3,451
Minnesota	1,860	1,672	1,631	1,843	2,339	1,982	2,022	2,289	2,809
Missouri	2,473	2,101	2,082	2,252	3,575	2,263	3,135	3,931	4,393
Nebraska	1,991	1,714	—	1,714	2,290	2,041	1,853	2,040	2,970
North Dakota	2,604	1,867	—	1,867	2,944	2,347	2,342	2,625	3,869
South Dakota	2,710	2,098	—	2,098	2,854	2,069	2,035	2,437	3,965
SOUTH	2,807	2,391	2,159	2,550	4,082	2,873	3,498	4,268	5,638
South Atlantic	2,675	2,297	2,075	2,586	3,947	3,073	3,296	4,133	5,543
Delaware	3,541	3,241	—	3,241	3,618	—	3,618	—	—
District of Columbia	1,408	1,408	1,408	—	—	—	—	—	—
Florida	2,423	2,294	2,255	2,320	3,706	3,673	2,871	5,471	6,740
Georgia	3,009	2,416	2,184	3,039	4,444	2,851	3,428	4,842	6,834
Maryland	2,216	2,138	2,121	4,238	2,797	2,601	2,395	3,004	4,100
North Carolina	3,285	2,630	—	2,630	4,139	4,005	3,701	3,725	5,945
South Carolina	3,512	2,818	—	2,818	4,361	3,371	4,539	4,990	6,306
Virginia	2,580	2,253	1,984	2,397	3,360	2,473	2,714	3,262	5,242
West Virginia	3,280	2,633	—	2,633	3,814	2,208	3,218	3,937	5,012
East South Central	3,110	2,472	3,052	2,455	4,318	2,658	3,672	4,525	5,884
Alabama	3,511	2,906	—	2,906	5,299	2,594	5,563	6,468	7,646
Kentucky	3,116	3,385	3,052	2,288	4,188	2,617	3,447	3,751	5,249
Mississippi	3,749	2,845	—	2,845	4,233	2,821	3,638	4,821	6,235
Tennessee	2,600	2,175	—	2,175	3,900	2,347	2,989	3,908	5,807
West South Central	2,853	2,510	2,280	2,704	4,103	2,705	3,731	4,284	5,450
Arkansas	3,370	2,683	—	2,683	4,034	2,703	4,109	3,701	5,194
Louisiana	2,959	2,414	2,224	2,602	4,837	3,209	4,020	6,034	7,762
Oklahoma	2,946	2,505	—	2,505	3,763	2,464	3,786	4,039	6,058
Texas	2,732	2,523	2,293	2,810	3,983	2,783	3,464	4,134	4,851
WEST	1,847	1,766	1,711	1,879	2,368	2,136	2,158	2,648	2,979
Mountain	2,107	1,844	1,681	1,903	2,694	2,207	2,463	3,024	3,248
Arizona	2,358	2,075	—	2,075	3,954	3,091	4,148	4,437	4,867
Colorado	1,860	1,768	1,681	1,999	2,373	—	2,033	2,583	2,452
Idaho	2,158	1,486	—	1,486	2,373	1,462	2,291	3,200	3,365
Montana	1,981	1,712	—	1,712	2,086	1,284	1,622	2,224	3,183
Nevada	2,251	2,069	—	2,069	3,564	—	2,660	3,100	4,194
New Mexico	2,958	2,087	—	2,087	3,733	2,984	4,058	4,537	6,894
Utah	1,703	1,597	—	1,597	2,260	—	1,744	1,944	2,998
Wyoming	2,080	—	—	—	2,380	2,114	2,007	2,646	3,057
Pacific	1,771	1,748	1,714	1,861	2,100	2,117	2,000	2,139	2,460
Alaska	2,690	—	—	—	—	—	—	—	—
California	1,834	1,813	1,797	1,880	2,166	2,541	2,082	2,090	1,978
Hawaii	1,836	1,792	—	1,792	2,051	2,051	—	—	—
Oregon	1,624	1,450	1,330	1,782	1,989	1,724	1,910	2,609	2,418
Washington	1,632	1,496	1,325	1,878	2,115	1,982	1,963	1,932	3,634

1/ Ratios of persons per active civilian dentist are based on some 98,600 dentists, which excludes 5,100 dentists who graduated in 1976 and 6,300 dentists whose location within a State could not be determined.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Economic Research and Statistics, Distribution of Dentists in the United States, by State, Region, District and County, 1976.

Table B-2
DISTRIBUTION OF COUNTIES ACCORDING TO RATIO OF PERSONS PER ACTIVE CIVILIAN DENTIST, BY STATE: 1976

State	Number of counties by persons-per-dentist ratios						
	Without any dentist	5,000 and over	4,000 to 4,999	3,000 to 3,999	2,000 to 2,999	Under 2,000	All counties
United States	267	710	397	394	773	373	3,114 1/
Alabama	2	40	9	8	8	-	67
Alaska	-	-	-	1	-	-	1
Arizona	-	3	4	2	4	1	14
Arkansas	6	24	14	17	12	2	75
California	1	1	2	2	17	35	58
Colorado	12	5	3	6	18	19	63
Connecticut	-	-	-	1	2	5	8
Delaware	-	-	1	1	1	-	3
District of Columbia	-	-	-	-	-	1	1
Florida	4	20	12	10	16	5	67
Georgia	33	63	18	25	17	3	159
Hawaii	-	-	-	-	1	3	4
Idaho	3	6	3	12	10	10	44
Illinois	5	14	13	34	30	6	102
Indiana	3	16	19	26	26	2	92
Iowa	1	11	17	19	41	10	99
Kansas	13	5	18	23	36	10	105
Kentucky	3	48	21	29	17	2	120
Louisiana	2	34	10	7	10	1	64
Maine	-	1	1	4	7	3	16
Maryland	-	4	3	5	7	5	24
Massachusetts	-	-	-	-	4	10	14
Michigan	1	6	11	16	33	16	83
Minnesota	-	8	5	16	39	19	87
Mississippi	4	42	11	16	8	1	82
Missouri	6	38	16	27	22	6	115
Montana	12	12	19	7	2	4	56
Nebraska	16	3	5	20	28	21	93
Nevada	6	3	-	1	6	1	17
New Hampshire	-	-	-	1	4	5	10
New Jersey	-	-	1	1	10	9	21
New Mexico	6	10	3	8	3	2	32
New York	-	4	1	17	22	18	62
North Carolina	7	39	11	20	20	3	100
North Dakota	11	7	3	11	12	9	53
Ohio	1	17	10	26	32	2	88
Oklahoma	5	25	15	18	11	3	77
Oregon	3	1	1	2	18	11	36
Pennsylvania	1	6	3	17	33	7	67
Rhode Island	-	-	-	1	2	2	5
South Carolina	1	19	11	10	5	-	46
South Dakota	18	10	7	7	20	5	67
Tennessee	6	33	18	15	19	4	95
Texas	43	60	45	53	44	9	254
Utah	5	1	2	7	4	10	29
Vermont	2	1	-	1	4	6	14
Virginia	21	40	17	13	21	24	136
Washington	2	3	-	5	14	15	39
West Virginia	-	21	10	12	9	3	55
Wisconsin	2	3	3	13	33	18	72
Wyoming	-	3	1	1	11	7	23

1/ Count of counties includes 40 independent cities, of which 38 are in Virginia, one is in Maryland, and one is in Missouri.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Economic Research and Statistics, Distribution of Dentists in the United States, by State, Region, District and County, 1976.

Table B-3

PERCENT DISTRIBUTION OF INDEPENDENT DENTISTS BY AVERAGE WAITING TIME FOR INITIAL APPOINTMENT, BY SIZE OF CITY: 1975

City size	1-2 days	3 days-1 week	1-2 weeks	2 weeks-1 month	1 month or more	Total
All independent dentists	15.7	27.7	30.0	18.1	8.5	100.0
Under 2,500	9.7	23.9	23.1	23.1	20.2	100.0
2,500 - 24,999	11.2	24.7	27.9	21.0	15.2	100.0
25,000 - 99,999	16.5	26.9	31.4	18.7	6.5	100.0
100,000 - 999,999	17.7	27.6	33.3	16.3	5.1	100.0
Over 1,000,000	21.1	38.0	25.1	12.7	3.1	100.0

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1975 Survey of Dental Practice.

Table B-4

PERCENT DISTRIBUTION OF INDEPENDENT DENTISTS ACCORDING TO PRACTICE BUSYNESS, BY SIZE OF CITY: 1975

City size	Too busy	Over-worked	Enough patients	Not busy enough	Total
All independent dentists	14.0	17.6	46.1	22.3	100.0
Under 2,500	25.0	22.7	39.4	12.9	100.0
2,500 - 24,999	21.0	20.3	40.8	17.9	100.0
25,000 - 99,999	12.0	16.4	48.6	23.0	100.0
100,000 - 999,999	10.2	16.0	48.7	25.1	100.0
Over 1,000,000	8.7	15.4	48.9	27.0	100.0

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1975 Survey of Dental Practice.

C. DENTAL PRACTICE CHARACTERISTICS

Types of Dental Employment

The overwhelming majority, approximately 88 percent, of the Nation's active dentists are in private practice (Table C-1). A breakdown of this group shows that 79 percent practice 30 or more hours per week, while the other 9 percent work less than 30 hours per week. The remaining active dentists, 12 percent, are distributed among a variety of institutional settings, with the largest portion, 4 percent, in the Armed Forces. Faculty and staff of dental schools account for 3 percent, and 2 percent are interns, residents, or students in advanced dental education.

There are notable professional differences between male and female active dentists. About one-fourth of the 1,900 active female dentists are part-time, providing dental services less than 30 hours a week, compared with 9 percent of the male dentists. The comparatively small number of female dentists are represented on the faculty of dental schools by a proportion three times greater than is the case with male dentists.

The 1975 Survey of Dental Practice conducted by the American Dental Association presents the average percent of time per week spent on various office procedures by independent dentists. (The term "independent dentist," used in this Section and the preceding Section B, includes all dentists receiving fees for services--i.e., not salaried--whether in solo practice, in partnership, or in group practice.) The breakdown of work time is very different for general practitioners and for specialists, as might be expected. General practioners spend 41 percent of their time on operative procedures, compared with only 8 percent for specialists (Table C-2). In contrast, orthodontic procedures take only 4 percent of the work time of general practitioners, but over 40 percent of the work time of the specialist group. Another contrast is the average percent of work time spent on oral surgery procedures, which is 23 percent for specialists and only 6 percent for general practitioners.

Trend in Auxiliary Utilization

The periodic ADA Surveys of Dental Practice conducted over the past two decades show that the proportion of independent dentists who use one or more dental auxiliaries has increased steadily. By 1975, 96 percent of all independent dentists--an overwhelming majority--employed at least one auxiliary of some type, a significant increase from 77 percent in 1955 (Table C-3). Well over 90 percent of the independent dentists employed one or more dental assistants in 1975, an increase of 22 percent since 1955. Much more dramatic, however, is the rise in the percentage of independent dentists employing one or more dental hygienists; this increased from only 10 percent in 1955 to 41 percent in 1975.

Patient Visits per Week

A strong and direct relationship between the extent of auxiliary utilization and the average number of patient visits per week was demonstrated in a national survey of licensed dentists conducted during the period 1967-1970 (Table C-4). On the average, general practitioners had 67 patient visits per week. The statistical breakdown shows a steady increase in weekly patient visits with each increase in the number of auxiliaries. The number of visits varied from 45 with no auxiliary, to 60 for dentists with one auxiliary, to 83 with three auxiliaries, and to 95 visits with four or more auxiliaries.

The number of patient visits per week also varies greatly by age group. The average number of patient visits increases from the number for dentists under 40 years of age to the highest patient-visit level for dentists in the age range 40-54. After age 54, there is a noticeable numerical decrease in patient visits for every age group. This age-related configuration holds also for every level of auxiliary utilization. Dentists in the age range 40-54 always have the highest number of visits, regardless of the number of auxiliaries utilized.

Data from ADA's 1977 Survey of Dental Practice show higher, but still somewhat similar, figures for number of patient visits per week, related to the age of the dentist. For independent dentists practicing alone (i.e., in solo practice), the average number of patient visits per week is 78.7 and the median is 70.0 (Table C-5). The highest average of 95.7 visits is recorded for the 35-39 age group, whereas the highest median of 84.6 patient visits per week is recorded by the dentists in the age range 40-44 years. The average number of weekly patient visits declines somewhat with each later age group, until dentists of 60 years and over record an average of 61.1; the median for this age group is 50.2 patient visits per week.

Practice Busyness

The ADA periodic surveys which ask independent dentists to assess the extent of their practice busyness show a generally increasing percentage, between 1964 and 1977, of dentists who felt they had enough patients and also did not feel overworked. By 1977, this category comprised half of all independent dentists (Table C-6). The 21 percent of independent dentists who reported in 1977 that they would like to have more patients was similar to the proportion reported in most of the earlier years. In 1977, only 11 percent had to turn away persons requesting appointments, a considerable decline from about 20 percent in the 1960's.

Professional Income and Expenses

The periodic ADA surveys show that, between 1964 and 1976, the average net annual income of all independent dentists more than doubled in

dollar amount, reaching $42,035 in 1976 for independent dentists practicing alone (Table C-7). This net income in 1976 constitutes 44 percent of the 1976 average gross income of $95,213. In 1964, average net income for all independent dentists had been over half (55 percent) of average gross income.

Throughout this period, specialists earned more than general practitioners, but increases in the net income of specialists were relatively smaller, rising from about $30,000 in 1964 to $56,987 (for specialists practicing alone) in 1976. Over the same period, the average net income of general practitioners increased from $18,469 to $40,616 (the latter figure applying to those practicing alone).

Average gross and net income of independent dentists both vary considerably according to age of the dentist. In 1976, for independent dentists practicing alone the average net income was $26,440 for those under 30, the lowest earnings for any age group (Table C-8). Highest average net income of more than $47,000 was earned by the dentists from 40 through 49 years. Net income declined thereafter for all older age groups, decreasing to about $33,000 earned by those dentists of 60 years and over.

All professional expenses of independent dentists have increased steadily in recent years. In 1970, the average practice expenses for all independent dentists were $27,768 (Table C-9). By 1974 this had increased to $43,425, and by 1976 it had increased (for independent dentists practicing alone) to $56,303. Throughout this period, the largest expense items were salaries of employees and commercial dental laboratory charges. From 1970 to 1976 average salaries paid to all employees increased from $10,528 to $17,457 and dental laboratory charges increased proportionally even more--from $4,427 to $10,438. The next largest expense items were dental and office supplies, and rent and/or mortgage payments, both over $5,000 in 1976 for independent dentists practicing alone.

Table C-1
NUMBER OF ACTIVE DENTISTS, BY PRIMARY TYPE OF DENTAL EMPLOYMENT:
DECEMBER 31, 1977

Primary type of dental employment	All dentists		Male		Female	
	Number	Percent distribution	Number	Percent distribution	Number	Percent distribution
Total	117,890	100.0	115,990	100.0	1,900	100.0
Practicing dentist (30 or more hours/week)	93,430	79.3	92,450	79.7	980	51.6
Practicing dentist (less than 30 hours/week)	10,380	8.8	9,910	8.6	470	24.7
On faculty or staff of dental school	3,330	2.8	3,150	2.7	180	9.4
Armed Forces dentist	5,170	4.4	5,150	4.4	20	1.1
Public health dentist	1,190	1.0	1,110	1.0	80	4.2
Hospital staff dentist	1,460	1.2	1,420	1.2	40	2.1
Intern/resident/student	2,530	2.2	2,420	2.1	110	5.8
Staff member of health or dental organization	400	0.3	380	0.3	20	1.1

SOURCE: Health Resouces Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Economic Research and Statistics.

Table C-2
AVERAGE PERCENT OF TIME SPENT PER WEEK ON VARIOUS PROCEDURES BY INDEPENDENT DENTISTS, BY TYPE OF PROCEDURE: 1975

Type of procedure	Type of dentist		
	All independent dentists	General practitioners	Specialists
All procedures	100.0	100.0	100.0
General procedures	12.0	12.8	9.1
Palliative procedures	3.4	3.9	1.4
Operative procedures	35.0	40.7	7.8
Prosthodontic procedures	18.6	21.9	2.4
Endodontic procedures	6.3	6.2	7.1
Periodontic procedures	5.4	4.9	8.7
Orthodontic procedures	10.9	3.6	40.4
Oral surgery procedures	8.4	6.0	23.1

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1975 Survey of Dental Practice.

Table C-3

PERCENT OF INDEPENDENT DENTISTS WHO EMPLOY AUXILIARIES: SELECTED YEARS 1955-1975

Year	Percent of dentists employing auxiliaries 1/		
	Dental hygienists	Dental assistants	Any type of auxiliaries 2/
1955	10.3	70.7	77.1
1958	14.0	75.5	81.8
1961	15.0	76.7	82.6
1964	20.2	82.4	89.9
1967	25.2	86.6	92.4
1970	30.8	85.6	89.9
1972	36.9	90.2	93.6
1975	41.3	92.5	96.1

1/ Any of these employees may be either full-time or part-time.

2/ Includes dental laboratory technicians and secretary-receptionists, as well as dental hygienists and dental assistants.

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1975 Survey of Dental Practice. Also prior reports of this series.

Table C-4

AVERAGE NUMBER OF PATIENT VISITS PER WEEK BY DENTISTS IN GENERAL PRACTICE, WITH DIFFERENT NUMBERS OF AUXILIARIES, RELATED TO AGE GROUP OF DENTIST: 1967-1970 1/

Number of full-time or part-time auxiliaries per dentist	Average number of visits per week, by age of dentist							
	All ages	Under 40	40-44	45-49	50-54	55-59	60-64	65 and over
All dentists	67	69	77	75	69	60	51	39
Dentists with:								
No auxiliaries	45	49	56	54	51	47	39	29
1 auxiliary	60	59	68	68	64	60	53	43
2 auxiliaries	72	71	77	77	74	70	65	51
3 auxiliaries	83	82	88	86	89	79	71	64
4 or more auxiliaries	95	92	98	98	100	98	84	81

1/ The data were derived from a national questionnaire survey of licensed dentists conducted through the individual State boards of dentistry during the period 1967-1970.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry. Auxiliaries per Dentist in Relation to Certain Dental Practice Characteristics, DHEW Publication No. (HRA) 78-7, compiled 1977.

Table C-5

NUMBER OF PATIENT VISITS PER WEEK OF INDEPENDENT DENTISTS PRACTICING ALONE, BY AGE GROUP: 1977

Age group	Number of visits per week	
	Average	Median
All ages	78.7	70.0
Under 30 years	59.5	50.3
30-34 years	71.4	62.6
35-39 years	95.7	82.4
40-44 years	92.5	84.6
45-49 years	90.1	79.8
50-54 years	79.4	70.3
55-59 years	75.3	74.5
60 years and over	61.1	50.2

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1977 Survey of Dental Practice.

Table C-6
PERCENT DISTRIBUTION OF INDEPENDENT DENTISTS ACCORDING TO PRACTICE BUSYNESS: SELECTED YEARS 1964-1977

Description of practice busyness	1964	1967	1970	1972	1975	1977
All independent dentists	100.0	100.0	100.0	100.0	100.0	100.0
Too busy to treat all people requesting appointments	19.2	21.7	17.0	15.1	14.0	11.0
Provided dental care for all who requested it, but felt overworked	21.1	23.7	20.0	19.3	17.6	17.8
Provided dental care for all who requested it, had enough patients, and did not feel overworked	36.8	40.8	44.1	43.8	46.1	49.9
Not busy enough; would like more patients	22.9	13.8	18.9	21.8	22.3	21.3

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1977 Survey of Dental Practice. Also prior reports of this series.

Table C-7
AVERAGE INCOME OF INDEPENDENT DENTISTS, BY GENERAL AND SPECIALTY PRACTICE: SELECTED YEARS 1964-1976

Year	All dentists		General practitioners		Specialists	
	Average gross income	Average net income	Average gross income	Average net income	Average gross income	Average net income
1964	$36,352	$19,835	$34,278	$18,469	$53,595	$30,577
1967	46,391	24,740	43,627	23,328	62,828	36,146
1970	59,325	30,770	56,550	28,776	78,062	43,853
1972	71,814	35,698	68,232	32,826	88,525	49,070
1974	76,000	34,000	74,000	33,000	97,000	45,000
1976 1/	95,213	42,035	92,540	40,616	124,320	56,987

1/ The 1976 data are for independent dentists practicing alone.

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1977 Survey of Dental Practice. Also prior reports of this series.

Table C-8
AVERAGE INCOME OF INDEPENDENT DENTISTS PRACTICING ALONE, BY AGE GROUP: 1976

Age group	Average gross income	Average net income
All ages	$95,213	$42,035
Under 30 years	65,527	26,440
30-34 years	90,579	37,692
35-39 years	111,467	46,848
40-44 years	113,659	47,440
45-49 years	105,669	47,613
50-54 years	102,190	45,863
55-59 years	89,531	43,744
60 years and over	68,038	32,975

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1977 Survey of Dental Practice.

Table C-9
AVERAGE PROFESSIONAL EXPENSES OF INDEPENDENT DENTISTS, BY TYPE OF EXPENSE: SELECTED YEARS 1970-1976

Type of expense 1/	Average practice expense 2/			
	1970	1972	1974	1976 3/
All expenses	$27,768	$33,738	$43,425	$56,303
Office rent or equivalent mortgage payment	2,802	3,126	3,636	5,109
Utilities	1,177	1,313	1,527	1,574
Salaries or commissions to employees	10,528	12,698	16,238	17,457
Employee benefits (not included in salaries)	402	691	1,062	2,152
Insurance related to dental practice	446	593	758	961
Depreciation of dental and office equipment	1,230	1,401	1,753	2,594
Taxes on business and business property	800	1,011	1,264	1,821
Interest on business indebtedness	349	498	757	899
Repairs	260	336	444	591
Legal and other professional fees	288	431	600	667
Bad debts (patient failure to pay)	700	808	1,115	1,718
Professional expenses (dental society dues, dental meetings, etc.)	592	772	957	1,483
Commercial dental laboratory charges	4,427	5,512	7,207	10,438
Dental materials, drugs, and office supplies	3,767	4,548	6,107	5,437

1/ Averages include dentists reporting zero expenditures for an item.

2/ Data on professional expenses in this table will not agree with expense figures obtained by subtracting net from gross income in Table C-7 because the data in the two tables were derived from somewhat different populations of reporting dentists.

3/ Data in this column are for independent dentists practicing alone. Also, two items of expense collected for 1976 were not obtained for earlier years; these expenses for 1976 are "Professional liability," $548, and "Other expenses," $2,854.

SOURCE: American Dental Association, Bureau of Economic Research and Statistics. The 1977 Survey of Dental Practice (for 1976 data), and also The 1975 Survey of Dental Practice (for 1970, 1972, and 1974 data contained in a Special Survey section).

D. DENTAL EDUCATION

Trends in Students and Graduates

Dental student enrollments have increased considerably in recent decades. From 1950 to 1977, total enrollment rose from 11,891 to 21,510 students, an increase of about 80 percent (Table D-1). From the mid-1960's onward, increases in dental school enrollments were, in large part, attributable to provisions of the Health Professions Educational Assistance (HPEA) Act of 1963 and its various amendments, which included provisions for construction of new schools and for expansion of the capacity of existing schools.

From 1950 to 1965, total enrollments showed a rather modest increase of some 2,000 students, reaching a total of 14,020 in 1965. After 1965, the impact of the HPEA Act began to be evident. By 1977, total enrollments had increased by about 7,500, 53 percent above the 1965 level. There is, of course, a similar contrast with regard to first-year enrollments. During the period 1950-65, first-year enrollments increased only by about 600 to some 3,800. By 1977, first-year enrollments totalled 5,954, an increase of 56 percent over the total in 1965.

During most of the 1960's, the number of dental graduates remained fairly steady, ranging from about 3,200 to about 3,400 a year. By the end of the 1960's, the number of graduates began to rise noticeably, with 3,749 dentists graduating in 1970. Thereafter, the increase accelerated, reaching a total of 5,177 dental graduates in 1977, an increase of 38 percent over the 1970 level.

Dental School Applicants

Over the years, the proportion of applicants admitted to dental school has fluctuated considerably. The number of dental school applicants increased rather steadily from 6,119 in 1960 to a high of 15,734 in 1975, followed by a sizeable decrease to 12,835 by 1977 (Table D-2). In academic year 1960-61, six of every ten applicants (59 percent) were enrolled. Beginning with academic year 1963-64, more applicants have been rejected than enrolled, despite the concurrent large increase in student places. This situation has prevailed every year to the present time, although with variations in the ratio of rejections to enrollments. In two recent years, only 37 percent of applicants were accepted--the lowest percentages in this period. In the 1977-78 academic year, the proportion of applicants accepted had increased to 46 percent.

Variations in Size of Graduating Classes

The 59 dental schools in the United States and Puerto Rico vary considerably in the number of students enrolled and in the number of

graduates. Three of these schools--New York University, Ohio State University, and University of Pennsylvania--together graduated a full 10 percent of all dentists graduating in 1977 (Table D-3). More than half of all dentists graduated that year came from 16 schools. In 1950, only six schools had as many as 100 graduates. In 1977, 22 schools had graduating classes of more than 100. Classes between 50 and 99 were graduated in 1977 by 24 dental schools. Graduating classes of fewer than 50 students were produced by 13 schools, but it should be noted that a large proportion of this latter group is accounted for by most of the recently-formed dental schools which are still building a student body.

Increase in Number of Dental Schools

Beginning with the academic year 1950-51, when a new dental school was activated, and up to the present, 20 new dental schools have been established and are training dentists (Table D-4). Even though two long-established schools closed in the early 1970's, the opening of the new schools provided a net increase of 18 schools since 1950. The high point in this development was the academic year 1972-73, when four new dental schools enrolled their first classes. The 60th dental school, at Oral Roberts University, is expected to enroll its first class by 1980. There are at present no known plans for the formation of any other new dental school.

Increases in dental school training capacity since the mid-1960's were due largely to Federal support for dental school expansion and new school construction and, with the decline in such support, the upward trend of both schools and students is not expected to continue.

Projections of Students and Graduates

Dental student enrollments and the number of graduates in the immediate future will increase less rapidly than during the last several years. Enrollment projections for the next decade indicate that the number of dental students will remain very close to the 1977-78 level. First-year enrollment is projected to decrease slightly, from 5,954 in 1977-78 to 5,900 in 1978-79 (Table D-5). Subsequent first-year enrollments are projected to continue at that level, resulting in a stabilization of the number of dental graduates at about 5,460 by 1981-82. These projected levels for graduates are expected to prevail thereafter through the academic year 1989-90.

During the 1970's, a number of dental schools changed their curriculums to compress the traditional four academic year-four calendar year (4-4) program into a four academic year-three calendar year (4-3) program, in order to accelerate the production of dental personnel. There is now a clear trend back to the 4-4 arrangement. This situation has resulted in the doubling of graduating classes by some

schools, while other schools skipped a graduating class. This accounts for the decrease in the number of graduates in 1977 from the preceding year. Slight variations in the annual number of graduates are expected before the level of graduates is stabilized at about 5,460 per year by 1982.

Dental School Location Related to Dentist Location

The data in Table D-6 comprise a reoriented presentation of some of the same statistics on the location of dental graduates in Table A-4 in the Dentist Supply Section. Both tables show that, on a national basis, 56 percent of the active civilian dentists are located in the same State where they graduated, 22 percent are located in the region, but not the State, of graduation, and another 22 percent are located in a different region than the one in which they graduated. In the earlier section, the data show where each State's active dentists graduated. In this section, the recompiled data show a different and important aspect--namely, where the graduates of each dental school for all classes through 1975 were located in 1976.

Some individual dental schools have a considerably higher percentage than the national average of their graduates who located in the same State or region or in a different region. More than 90 percent of the graduates of four schools are located in the same State where they graduated--the University of Texas at Houston, the University of California at San Francisco, the Medical University of South Carolina, and the University of the Pacific. There are two schools where more than half of the graduates located outside the State of graduation but still within the same region--the University of Pennsylvania (61 percent) and Emory University (56 percent). There are four schools with 55 percent or more of their graduates located outside both State and region of graduation--Georgetown, Northwestern, Washington, and Creighton Universities.

Minority Students

During the 1970's, the dental school enrollment of minority students increased rather steadily. First-year minority enrollment increased from 412 students, or 9 percent, in 1971-72, to 641 students, or 11 percent of the first-year enrollment of all dental students, in academic year 1977-78 (Table D-7). In 1971-72, all minority students constituted only 6 percent of total enrollment, and this had increased to 10 percent by 1977-78.

Although Blacks were the largest minority group throughout the 1970's, by 1977-78 they still comprised only 968 dental students, or less than 5 percent of the total enrollment (Table D-8). Orientals followed with more than 3 percent and Hispanics with less than 2 percent. Each successive entering class shows a progressively higher enrollment,

with 446 minority students in the senior class and 641 in the first-year class. Another significant indication of the increase in minority enrollment is the fact that minority graduates in 1977 constituted 9 percent of all dental graduates, nearly double the proportion in 1972.

Women Students

One of the most notable and significant developments in dental education in the 1970's has been the rapid and steep increase in enrollment of women students. First-year enrollment of women dental students rose from 94 in academic year 1970-71 to 880 in 1977-78, more than a nine-fold increase (Table D-9). Over this same period, female students, as a proportion of all first-year dental students, increased from 2 percent to nearly 15 percent.

The rise in the total enrollment of women dental students was similar to the increase in first-year enrollment. In 1977-78, there were 2,796 women enrolled in dentistry, a full 13 percent of all dental students in the United States (Table D-10). This upward trend is similarly evident in the breakdown of the 1977-78 enrollment of female dental students, by class year. Close to one-third of all female dental students are now in the first-year class. In contrast, women students in the fourth-year class represent only about one-fifth of the total female enrollment in dental schools.

The number of women graduating from schools of dentistry has also increased substantially since 1972. In that year, there were only 40 female graduates; in 1977, 369 women were graduated from dental schools in the United States.

Advanced Dental Education

A considerable proportion of students graduating with the dental degree later undertake various types of advanced dental education. From 1973 to 1977 there has been a noteworthy increase in the number of graduates from dental general practice residency programs and a concurrent very slight decline in number of dental specialty graduates. In 1973 there were 530 graduates from general practice residencies, increasing to 695 by 1977, a gain of 31 percent (Table D-11). The graduates from the specialty programs have held at about the same numbers over the same period, with a high of 1,279 in 1974 and a low of 1,209 in 1976.

In 1977, there were 3,524 students in various types of advanced dental education (Table D-12). The first-year enrollment in all such programs was 1,963, of whom 753 students were in general practice residencies, chiefly in institutions other than dental schools, and 1,210 were in training programs for dental specialties, the great majority in dental

schools. Of the 931 first-year specialty students in dental schools, the largest numbers were in orthodontics and periodontics. Of the 279 students in specialty programs outside dental schools, by far the largest number were enrolled in oral surgery. In 1977, a total of 1,919 students graduated from general practice residencies and specialty programs, more than one-third the number of dental school graduates in that same year.

Educational Costs to Dental Students

Tuition and other educational costs to the dental student have risen steadily in recent years. Between academic years 1971-72 and 1977-78 first-year tuition at least doubled for both in-State (resident) and out-of-State (non-resident) students, whether in public or private dental schools (Table D-13). First-year tuition, averaged for all schools, rose from $1,418 in academic year 1971-72 to $3,020 in 1977-78 for resident students and, over the same period, from $1,967 to $4,078 for non-residents.

Another aspect of tuition is the considerable difference between public and private schools. In academic year 1977-78, for in-State residents, average first-year tuition of public schools was $1,812 and, averaged for all types of private schools, it was $4,782. The difference was less extreme with regard to out-of-State students--averaging $3,393 for public schools and $5,020 for all private schools. For the State-related private schools (those receiving some State funds), average first-year tuition was $4,026 for residents and only slightly more, $4,544, for non-residents. The entirely-private schools (those who receive no State funds) charge the same $5,422 first-year tuition to residents and non-residents alike.

Between academic years 1971-72 and 1977-78 the overall first-year educational costs (which include tuition) rose steeply, although less steeply than did tuition alone. Nevertheless, these overall costs almost doubled in all cases--for resident and non-resident students in both public and private schools. In that period, the overall first-year educational cost, averaged for resident students of all schools, rose from $2,833 to $5,236, and for non-resident students from $3,382 to $6,294. In academic year 1977-78, the average overall educational costs for resident students in public schools was $4,022 and for resident students in private schools it was $7,002. The difference was less in the case of non-residents--averaging $5,603 for public schools and $7,243 for private schools.

School Costs per Dental Student

The costs of dental schools per dental student have also increased steadily over recent years, for both public and private schools, and for schools of whatever size of dental classes. In the academic year

1976-77, the average annual cost of all schools per dental student was $19,800 (Table D-14). The figure for public schools was $23,100 and for private schools $15,900.

As might be expected, schools with smaller enrollments generally had higher expenditures per dental student than the schools with a large student body. In academic year 1976-77, among public schools the average school costs per dental student were $33,100 for schools with the smallest enrollment (250 students or less) and $18,200 for schools with the largest enrollment (over 350 students). There was also a large difference in private school costs, with $25,000 per student spent by the smallest schools and $15,600 per student by the largest schools.

Table D-1
NUMBER OF DENTAL SCHOOLS, STUDENTS, AND GRADUATES: SELECTED ACADEMIC YEARS 1950-51 THROUGH 1977-78

Academic year	Number of schools	Number of students		Number of graduates
		Total	First year	
1950-51	42	11,891	3,226	2,830
1955-56	43	12,730	3,445	3,038
1960-61	47	13,580	3,616	3,290
1961-62	47	13,513	3,605	3,207
1962-63	48	13,576	3,680	3,233
1963-64	48	13,691	3,770	3,213
1964-65	49	13,876	3,836	3,181
1965-66	49	14,020	3,806	3,198
1966-67	49	14,421	3,942	3,360
1967-68	50	14,955	4,200	3,457
1968-69	52	15,408	4,203	3,433
1969-70	53	16,008	4,355	3,749
1970-71	53	16,553	4,565	3,775
1971-72	52	17,305	4,745	3,961
1972-73	56	18,376	5,337	4,230
1973-74	58	19,369	5,445	4,515
1974-75	58	20,146	5,617	4,969
1975-76	59	20,767	5,763	5,336
1976-77	59	21,013	5,935	5,177
1977-78	59	21,510	5,954	-- 1/

1/ Data are not available at this time.

SOURCE: American Dental Association, Council on Dental Education. Dental Students' Register for each selected academic year from 1950-51 through 1966-67. Annual Report on Dental Education for all subsequent academic years.

Table D-2

NUMBER OF DENTAL SCHOOL APPLICANTS IN RELATION TO NUMBER OF FIRST-YEAR DENTAL STUDENTS: ACADEMIC YEARS 1960-61 THROUGH 1977-78

Academic year	Number of applicants	Number of first-year students	Number of applicants per first-year student	Percent of applicants enrolled
1960-61	6,119	3,616	1.7	59
1961-62	5,841	3,605	1.6	62
1962-63	6,566	3,680	1.8	56
1963-64	8,969	3,770	2.4	42
1964-65	9,598	3,836	2.5	40
1965-66	9,988	3,806	2.6	38
1966-67	10,177	3,942	2.6	39
1967-68	10,264	4,200	2.4	41
1968-69	9,037	4,203	2.2	46
1969-70	10,325	4,355	2.4	42
1970-71	10,413	4,565	2.3	44
1971-72	11,012	4,745	2.3	43
1972-73	13,542	5,337	2.5	39
1973-74	14,876	5,445	2.7	37
1974-75	14,970	5,617	2.7	38
1975-76	15,734	5,763	2.7	37
1976-77	14,807	5,935	2.5	40
1977-78	12,835	5,954	2.2	46

SOURCE: American Association of Dental Schools, Office of Resources. Applicant Analysis, 1977 Entering Class. Also prior annual reports for 1976 and 1975.

American Dental Association, Council on Dental Education. Analysis of Applicants to Dental School and First-Year Enrollment 1974. Supplement 7 to Annual Report on Dental Education 1974-75. Also prior annual reports.

Table D-3

NUMBER OF STUDENTS AND GRADUATES OF INDIVIDUAL DENTAL SCHOOLS, BY STATE: 1977

State and school	Number of students as of October 15, 1977		Number of graduates 1976-77
	Total	First year	
Total	21,910	5,954	5,177
ALABAMA			
University of Alabama	382	72	59
CALIFORNIA			
University of the Pacific	480	130	137
University of California	348	89	86
University of California at Los Angeles	431	100	102
University of Southern California	511	141	129
Loma Linda University	334	93	69
COLORADO			
University of Colorado	99	35	31
CONNECTICUT			
University of Connecticut	183	51	38
DISTRICT OF COLUMBIA			
Howard University	264	100	67
Georgetown University	377	147	140
FLORIDA			
University of Florida	221	61	53
GEORGIA			
Emory University	495	196	91
Medical College of Georgia	181	61	52
ILLINOIS			
Loyola University	535	137	132
Northwestern University	409	100	96
Southern Illinois University	140	48	37
University of Illinois	536	133	125
INDIANA			
Indiana University	508	130	129
IOWA			
University of Iowa	377	97	87
KENTUCKY			
University of Kentucky	242	60	58
University of Louisville	341	89	78
LOUISIANA			
Louisiana State University	369	101	91
MARYLAND			
University of Maryland	532	136	127
MASSACHUSETTS			
Harvard School of Dental Medicine	77	30	22
Boston University	536	41	23
Tufts University	468	162	133
MICHIGAN			
University of Detroit	341	86	5
University of Michigan	582	133	148
MINNESOTA			
University of Minnesota	580	150	141
MISSISSIPPI			
University of Mississippi	82	20	-
MISSOURI			
University of Missouri at Kansas City	438	139	134
Washington University	213	65	78
NEBRASKA			
Creighton University	298	77	73
University of Nebraska	283	66	64
NEW JERSEY			
Fairleigh Dickinson University	319	83	81
New Jersey Dental School	227	83	66
NEW YORK			
Columbia University	221	64	55
New York University	585	205	209
State University of New York at Stony Brook	91	34	31
State University of New York at Buffalo	307	87	92
NORTH CAROLINA			
University of North Carolina	322	83	78
OHIO			
Ohio State University	590	199	187
Case Western Reserve University	480	106	96
OKLAHOMA			
University of Oklahoma	189	78	22
OREGON			
University of Oregon	303	83	76
PENNSYLVANIA			
Temple University	560	211	134
University of Pennsylvania	636	161	162
University of Pittsburgh	324	137	138
SOUTH CAROLINA			
Medical University of South Carolina	161	36	53
TENNESSEE			
Meharry Medical College	172	58	39
University of Tennessee	365	156	157
TEXAS			
Baylor College of Dentistry	504	129	122
University of Texas at Houston	489	126	123
University of Texas at San Antonio	466	151	29
VIRGINIA			
Virginia Commonwealth University	436	110	104
WASHINGTON			
University of Washington	393	105	95
WEST VIRGINIA			
West Virginia University	238	62	52
WISCONSIN			
Marquette University	540	137	134
PUERTO RICO			
University of Puerto Rico	233	64	36

SOURCE: American Dental Association, Council on Dental Education, Annual Report on Dental Education, 1977-78.

57

Table D-4

NEW DENTAL SCHOOLS SINCE 1950 AND
ACADEMIC YEAR OF ENROLLMENT OF FIRST CLASS

Academic year first class enrolled	Dental school
1950-51	University of North Carolina
1953-54	Loma Linda University
1956-57	Fairleigh Dickinson University
	New Jersey Dental School
1957-58	West Virginia University
	University of Puerto Rico
1962-63	University of Kentucky
1964-65	University of California at Los Angeles
1967-68	Medical University of South Carolina
1968-69	University of Connecticut
	Louisiana State University
1969-70	Medical College of Georgia
1970-71	University of Texas at San Antonio
1972-73	Boston University
	University of Florida
	Southern Illinois University
	University of Oklahoma
1973-74	University of Colorado
	State University of New York at Stony Brook
1975-76	University of Mississippi
Expected in 1979-80	Oral Roberts University

NOTE: Offsetting the opening of new schools since 1950 was the closing of the dental schools at St. Louis University in 1970 and at Loyola University at New Orleans in 1971.

SOURCE: American Dental Association, Council on Dental Education. Dental Students' Register for each given academic year from 1950-51 through 1964-65. Annual Report on Dental Education for all subsequent academic years.

Table D-5

ACTUAL AND PROJECTED NUMBERS OF STUDENTS AND GRADUATES OF DENTAL SCHOOLS, BY 4-YEAR AND 3-YEAR PROGRAMS: ACADEMIC YEARS 1975-76 THROUGH 1989-90

Academic year	Number of schools	Number of students		Number of graduates
		Total	First year	
All programs				
1975-76	59	20,767	5,763	5,336
1976-77	59	21,013	5,935	5,177
1977-78	59	21,510	5,954	5,110
1978-79	59	21,290	5,900	5,310
1979-80	60	21,380	5,900	5,210
1980-81	60	21,630	5,900	5,380
1981-82 through 1989-90	60	21,720	5,900	5,460
Four-year programs				
1975-76	44	16,464	4,326	3,894
1976-77	46	16,985	4,626	3,744
1977-78	53	17,908	4,983	3,780
1978-79	53	18,050	4,920	4,070
1979-80	54	18,480	4,920	4,260
1980-81	54	18,770	4,920	4,470
1981-82 through 1989-90	54	18,860	4,920	4,550
Three-year programs				
1975-76	15	4,303	1,437	1,442
1976-77	13	4,028	1,309	1,433
1977-78	6	3,602	971	1,330
1978-79	6	3,240	980	1,240
1979-80	6	2,900	980	950
1980-81	6	2,860	980	910
1981-82 through 1989-90	6	2,860	980	910

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

TABLE D-6
DENTAL SCHOOL FROM WHICH DENTIST GRADUATED, IN RELATION TO DENTIST LOCATION IN 1976

Dental school from which dentist graduated	Professionally-active civilian dentists			
	Number	Percent distribution by location		
		Dentist in same State where graduated	Dentist in same region, but not same State where graduated	Dentist in some region other than where graduated
United States	102,408 1/	56.3	21.9	21.8
Active Schools with Graduates in 1975				
University of Alabama	1,002	70.3	25.4	4.3
University of the Pacific	1,906	90.0	7.7	2.3
University of California at Los Angeles	505	84.0	10.7	5.3
University of California at San Francisco	2,071	91.8	6.7	1.5
University of Southern California	3,325	89.4	9.2	1.4
Loma Linda University	893	65.5	16.0	18.5
University of Connecticut	46	43.5	34.8	21.7
Georgetown University	2,468	9.7	26.1	64.2
Howard University	1,263	12.9	35.2	51.9
Emory University	2,708	38.3	56.0	5.7
Medical College of Georgia	128	80.5	14.0	5.5
Loyola University at Maywood	3,155	54.9	13.1	32.0
Northwestern University	2,859	29.9	13.9	56.2
Southern Illinois University	16	75.0	18.8	6.2
University of Illinois	2,267	68.0	5.7	26.3
Indiana University	2,401	68.3	8.2	23.5
University of Iowa	1,679	57.4	12.8	29.8
University of Kentucky	386	57.5	24.1	18.4
University of Louisville	1,685	46.8	30.1	23.1
Louisiana State University	120	89.2	10.0	0.8
University of Maryland	3,121	34.4	21.6	44.0
Harvard School of Dental Medicine	581	50.4	37.7	11.9
Tufts University	3,291	50.0	41.0	9.0
University of Detroit	1,899	82.2	3.5	14.3
University of Michigan	2,765	75.4	3.8	20.8
University of Minnesota	3,075	63.9	12.0	24.1
University of Missouri at Kansas City	3,307	26.4	26.8	46.8
Washington University	1,514	26.4	17.0	56.6
Creighton University	1,297	21.5	23.6	54.9
University of Nebraska	1,122	41.5	12.4	46.1
Fairleigh Dickinson University	669	47.8	36.6	15.6
New Jersey Dental School	613	56.0	33.1	10.9
Columbia University	1,525	70.4	19.2	10.4
New York University	5,539	74.6	16.7	8.7
State University of New York at Buffalo	1,845	79.1	10.0	10.9
University of North Carolina	967	82.5	12.8	4.7
Ohio State University	3,520	75.4	3.5	21.1
Case Western Reserve University	1,882	57.1	3.3	39.6
University of Oregon	2,173	50.8	46.2	3.0
Temple University	4,288	47.1	39.2	13.7
University of Pennsylvania	4,206	23.0	60.6	16.4
University of Pittsburgh	3,158	64.3	14.1	21.6
Medical University of South Carolina	163	90.8	7.4	1.8
Meharry Medical College	746	9.7	39.5	50.8
University of Tennessee	3,131	45.6	46.3	8.1
Baylor College of Dentistry	2,483	72.9	14.2	12.9
University of Texas at Houston	2,158	92.4	3.0	4.6
University of Texas at San Antonio	21	80.9	4.8	14.3
Virginia Commonwealth University	1,909	61.8	31.6	6.6
University of Washington	1,386	76.8	21.5	1.7
West Virginia University	498	39.2	32.7	28.1
Marquette University	3,198	58.4	13.3	28.3
Schools extinct in 1975				
Loyola University at New Orleans	1,374	67.7	26.9	5.4
St. Louis University	1,903	27.2	22.2	50.6
19 Other extinct schools	200	55.5	30.5	14.0

1/ Excludes some 7,600 dentists, among them all the 1976 graduates of U. S. dental schools, the graduates of foreign dental schools, and dentists whose school of graduation is unknown.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table D-7

MINORITY STUDENTS IN FIRST YEAR OF DENTAL SCHOOL: ACADEMIC YEARS 1971-72 THROUGH 1977-78 1/

Academic year	Total first year students	Racial/ethnic category							Percent minority of total first-year students
		Black	American Indian	Mexican-American	Puerto Rican	Oriental	Other minority	Total minority	
1971-72	4,705	245	4	27	13	112	11	412	8.8
1972-73	5,287	266	5	53	3	138	10	475	9.0
1973-74	5,389	273	12	64	5	141	34	529	9.8
1974-75	5,555	279	12	68	7	142	43	551	9.9
1975-76	5,697	298	22	64	11	186	56	637	11.2
1976-77	5,869	291	21	81	15	174	68	650	11.1
1977-78	5,890	296	10	2/	2/	225	2/	641	10.9

1/ Excludes University of Puerto Rico.

2/ The data for 1977-78 differ from earlier years because of changes in racial/ethnic categories used for data collection. In 1977-78 there were 110 first-year students under a new category "Hispanic." Also, the former category of "Other minority" was eliminated.

SOURCE: American Dental Association, Council on Dental Education. Minority Student Enrollment and Opportunities in U.S. Dental Schools, for 1971-72 and for 1972-73. Minority Report; Supplement of Annual Report on Dental Education 1973-74, and reports for subsequent academic years.

Table D-8
MINORITY STUDENTS IN DENTAL SCHOOLS IN 1977-78,
BY CLASS YEAR, AND 1977 MINORITY GRADUATES 1/

	Total students	Racial/ethnic category					Percent minority of total students
		Black	Hispanic	American Indian	Oriental	Total minority	
All classes	21,277	968	390	59	743	2,160	10.1
First year	5,890	296	110	10	225	641	10.9
Second year	5,745	260	115	17	214	606	10.5
Third year	4,517	212	81	21	153	467	10.3
Fourth year	5,125	200	84	11	151	446	8.7
1977 graduates	5,141	215	69	15	162	461	9.0

1/ Excludes University of Puerto Rico.

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Education, 1977-78.

Table D-9
FIRST-YEAR STUDENTS IN DENTAL SCHOOLS, BY SEX:
ACADEMIC YEARS 1970-71 THROUGH 1977-78

Academic year	All first-year students	Male students	Female students	Percent female of first-year students
1970-71	4,565	4,471	94	2.1
1971-72	4,745	4,598	147	3.1
1972-73	5,337	5,113	224	4.2
1973-74	5,445	5,054	391	7.2
1974-75	5,617	4,986	631	11.2
1975-76	5,763	5,056	707	12.3
1976-77	5,935	5,133	802	13.5
1977-78	5,954	5,074	880	14.8

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Education, 1977-78. Also prior annual issues.

Table D-10
FEMALE STUDENTS IN DENTAL SCHOOLS,
BY CLASS YEAR: ACADEMIC YEAR 1977-78

	Total	1st Year	2nd Year	3rd Year	4th Year
Total students	21,510	5,954	5,807	4,577	5,172
Female students	2,796	880	780	542	594
Percent of total students	13.0	14.8	13.4	11.8	11.5
Percent of female students	100.0	31.5	27.9	19.4	21.2

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Education, 1977-78.

Table D-11
GRADUATES OF DENTAL GENERAL PRACTICE RESIDENCIES AND DENTAL SPECIALTY PROGRAMS: 1973-1977

Type of graduate	Year of graduation				
	1973	1974	1975	1976	1977
All graduates	1,802	1,869	1,886	1,930	1,919
General practice graduates	530	590	641	721	695
Specialty graduates, total	1,272	1,279	1,245	1,209	1,224
Orthodontics	348	360	356	313	287
Oral surgery	233	230	216	222	217
Periodontics	196	186	192	183	206
Pedodontics	179	164	172	151	169
Endodontics	130	131	134	146	144
Prosthodontics	143	166	141	151	161
Oral pathology	19	24	17	19	21
Public health dentistry	24	18	17	24	19

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Advanced Dental Education, 1977-78. Also prior annual issues.

Table D-12

STUDENTS AND GRADUATES IN DENTAL GENERAL PRACTICE RESIDENCIES AND DENTAL SPECIALTY PROGRAMS: 1977

Type of program	Number of students as of October 15, 1977		Number of graduates 1976-77
	Total	First year	
All programs	3,524	1,963	1,919
General practice residencies, total	830	753	695
Dental schools	55	43	29
Non-dental-school institutions	775	710	666
Specialty programs, total 1/	2,694	1,210	1,224
Dental schools, total	1,990	931	895
Orthodontics	544	272	261
Oral surgery	348	108	96
Periodontics	337	169	179
Pedodontics	249	124	129
Endodontics	234	121	112
Prosthodontics	223	115	103
Oral pathology	50	20	13
Public health dentistry	5	2	2
Non-dental-school institutions, total	704	279	329
Orthodontics	52	24	26
Oral surgery	347	113	121
Periodontics	47	20	27
Pedodontics	84	40	40
Endodontics	39	19	32
Prosthodontics	102	49	58
Oral pathology	12	5	8
Public health dentistry	21	9	17

1/ Nine students and two graduates are excluded from these data because they studied combinations of specialties and cannot be assigned to any one specialty.

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Advanced Dental Education, 1977-78.

Table D-13

AVERAGE FIRST-YEAR TUITION AND AVERAGE TOTAL FIRST-YEAR EDUCATIONAL COSTS FOR RESIDENT AND NON-RESIDENT DENTAL STUDENTS, BY PUBLIC AND PRIVATE SCHOOLS: ACADEMIC YEARS 1971-72 THROUGH 1977-78

Academic year	First-year tuition					All first-year educational costs, including tuition 1/				
	All schools	Public schools	Private schools			All schools	Public schools	Private schools		
			All types	State-related	Other private			All types	State-related	Other private
					Resident					
1971-72	$1,418	$ 792	$2,208	$1,612	$2,418	$2,833	$2,142	$3,702	$3,356	$3,824
1972-73	1,435	843	2,264	1,839	2,439	2,850	2,121	3,758	3,480	3,869
1973-74	1,744	1,128	2,831	2,122	3,185	3,419	2,751	4,480	3,968	4,839
1974-75	1,928	1,176	2,992	2,623	3,257	3,834	2,995	5,021	4,581	5,337
1975-76	2,206	1,362	3,436	2,812	3,882	4,227	3,259	5,597	4,928	6,075
1976-77	2,615	1,638	4,039	3,341	4,632	4,801	3,762	6,320	5,568	6,960
1977-78	3,020	1,812	4,782	4,026	5,422	5,236	4,022	7,002	6,331	7,575
					Non-resident					
1971-72	$1,967	$1,661	$2,352	$2,163	$2,418	$3,382	$3,011	$3,846	$3,907	$3,824
1972-73	2,005	1,722	2,368	2,195	2,439	3,420	3,000	3,862	3,836	3,869
1973-74	2,338	2,089	2,969	2,536	3,185	4,013	3,712	4,618	4,382	4,839
1974-75	2,518	2,065	3,160	2,623	3,257	4,424	3,884	5,189	4,581	5,337
1975-76	2,842	2,363	3,640	3,302	3,882	4,863	4,260	5,801	5,418	6,075
1976-77	3,438	2,971	4,244	3,786	4,632	5,624	5,095	6,525	6,013	6,960
1977-78	4,078	3,393	5,020	4,544	5,422	6,294	5,603	7,243	6,849	7,575

1/ Educational costs include instruments, books, materials, laboratory and other fees and rentals.

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Education, 1977-78. Also prior annual reports.

Table D-14

AVERAGE ANNUAL COST TO PUBLIC AND PRIVATE DENTAL SCHOOLS PER DENTAL STUDENT, BY SCHOOL SIZE: ACADEMIC YEARS 1967-68 THROUGH 1976-77 1/

Academic year	All schools	Public schools				Private schools			
		All	Small	Medium	Large	All	Small	Medium	Large
		(In thousands)							
1967-68	$ 7.3	$ 8.9	$11.7	$ 9.5	$ 7.7	$ 5.9	$ 7.6	$ 5.6	$ 5.4
1968-69	8.5	10.1 2/	-	-	-	6.8 2/	-	-	-
1969-70	9.5	11.1	14.7	10.8	9.8	8.0	10.5	7.9	7.4
1970-71	10.3	11.7	15.1	10.8	10.6	8.8	11.3	8.4	8.4
1971-72	12.0 2/	-	-	-	-	-	-	-	-
1972-73	13.4	15.9	23.9	16.1	13.1	10.9	15.8	10.6	10.3
1973-74	14.7	17.4	24.7	18.6	14.6	11.7	15.5	11.5	11.3
1974-75	16.4	19.4	29.6	21.7	16.7	13.0	22.4	12.2	12.6
1975-76	17.8	20.7	31.9	21.5	16.0	14.5	25.8	13.7	13.9
1976-77	19.8	23.1	33.1	24.5	18.2	15.9	25.0	14.8	15.6

1/ Small-school enrollment is 250 or less; medium, 251-350; and large, over 350.

2/ Further breakdown of school costs are not available.

SOURCE: American Dental Association, Council on Dental Education. Financial Report, Fiscal Year Ending June 30, 1977. Supplement 4 to the Annual Report on Dental Education 1977-78. Also prior annual reports.

E. ALLIED DENTAL PERSONNEL SUPPLY

Dental Hygienists

The 32,200 active dental hygienists in 1977 represent a ten-fold increase since 1950 (Table E-1). The 15,100 active hygienists in 1970 more than doubled in number by 1977.

During the period 1950-1970, the ratio of active dental hygienists per 100 active dentists rose from 4 to 15, indicating that the number of dental hygienists increased substantially faster than the number of dentists. After 1970, there was relatively an even greater increase in dental hygienists so that, by 1977, the ratio of active dental hygienists per 100 active dentists was 27.

Among the Nation's geographic areas, New England had the best supply of dental hygienists in 1977, with 45 active hygienists per 100 active civilian dentists (Table E-2). The Mountain Division had the lowest ratio, with 23 per 100. Among the individual States, ten had a ratio of more than 40 active hygienists per 100 active civilian dentists. At the other end of the scale, nine States and the District of Columbia had ratios of less than 20 per 100.

Dental hygienists move in and out of the dental work force to a considerable degree. At any one time, only about one-half (51 percent) of all hygienist graduates are actively employed as hygienists (Table E-3). Hygienist graduates in the ages 30 through 39 are especially likely to leave the work force; less than four of every ten of these are working as hygienists, probably because most of the others are primarily occupied in the raising of families. Some of the hygienist graduates then return to the work force, so that close to half in the age range 40-44 are employed as hygienists. The proportion then gradually diminishes with each older age group.

Dental hygienists in the active work force constitute a relatively young group. Of the total number of hygienists active in 1977, virtually one half (49 percent) were under the age of 25. Over 75 percent of the active supply were less than 35 years old. Toward the other end of the age range, only 5 percent of active dental hygienists were estimated to be age 55 or older.

Dental Assistants

In the years from 1950 to 1977, the number of active dental assistants in the United States increased substantially from 55,200 to 144,700, or more than two and one-half times (Table E-4). The largest part of the increase took place in the 1965-1977

period, when the number increased by some 57,000. The ratio of active assistants to active dentists rose from 70 per 100 in 1950 to 91 per 100 in 1965 to 123 per 100 in 1977.

The geographic distribution of dental assistants varies considerably. In 1977, the West had 141 active dental assistants per 100 active civilian dentists, the highest ratio, while the Northeast had the lowest ratio with 97 per 100 (Table E-5). Among the individual States, 13 had a ratio of 140 or more active dental assistants per 100 active civilian dentists. At the other extreme, four States had ratios of less than 100 active dental assistants per 100 active civilian dentists.

Dental Laboratory Technicians

In 1977, there were approximately 45,100 active dental laboratory technicians in the United States, three times the number in 1950 (Table E-6). During the period 1950 to 1977, the ratio of active technicians to active dentists doubled from 19 per 100 to 38 per 100.

The distribution of active dental laboratory technicians in 1977 varied among regions from a high of 46 per 100 active civilian dentists in the West to a low of 36 per 100 in the South (Table E-7). The ratio of active technicians to active civilian dentists varied considerably from State to State. In 1977, five States had a ratio of 50 or more active technicians per 100 active civilian dentists; ten States and the District of Columbia had a ratio of less than 30 per 100. In 1977, more than three-fourths (36,700) of all active dental laboratory technicians were employed in commercial dental laboratories, whereas the remainder, some 8,400, worked within dental practices.

Table E-1

ESTIMATED NUMBER OF ACTIVE DENTAL HYGIENISTS AND NUMBER PER 100 ACTIVE DENTISTS: SELECTED YEARS 1950-1977

Year	Number of active hygienists	Number per 100 active dentists
1950	3,190	4.0
1955	4,160	4.9
1960	8,800	9.8
1965	11,600	12.1
1970	15,100	14.8
1975	26,900	24.0
1976	29,740	25.9
1977	32,200	27.3

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table B-2

ESTIMATED NUMBER OF ACTIVE DENTAL HYGIENISTS AND NUMBER PER 100 ACTIVE CIVILIAN DENTISTS, BY REGION, DIVISION, AND STATE: DECEMBER 31, 1977

Geographic area	Number of active hygienists	Number per 100 active civilian dentists
UNITED STATES	32,200	28
NORTHEAST	9,488	30
New England	3,316	45
Connecticut	873	45
Maine	172	38
Massachusetts	1,749	46
New Hampshire	188	43
Rhode Island	138	30
Vermont	196	74
Middle Atlantic	6,172	26
New Jersey	866	20
New York	3,777	28
Pennsylvania	1,529	25
NORTH CENTRAL	8,261	29
East North Central	5,839	29
Illinois	1,348	25
Indiana	553	27
Michigan	1,946	44
Ohio	1,120	23
Wisconsin	872	34
West North Central	2,422	29
Iowa	361	29
Kansas	231	23
Minnesota	981	41
Missouri	455	20
Nebraska	214	25
North Dakota	77	26
South Dakota	103	35
SOUTH	8,196	29
South Atlantic	4,639	31
Delaware	106	42
District of Columbia	73	11
Florida	1,363	35
Georgia	880	46
Maryland	522	22
North Carolina	826	42
South Carolina	306	30
Virginia	405	17
West Virginia	158	25
East South Central	1,559	30
Alabama	706	60
Kentucky	297	22
Mississippi	74	10
Tennessee	482	25
West South Central	1,998	24
Arkansas	122	18
Louisiana	223	15
Oklahoma	145	13
Texas	1,508	29
WEST	6,255	26
Mountain	1,196	23
Arizona	262	24
Colorado	415	28
Idaho	112	24
Montana	79	19
Nevada	48	22
New Mexico	141	29
Utah	82	10
Wyoming	37	18
Pacific	5,059	26
Alaska	39	18
California	3,677	26
Hawaii	130	23
Oregon	457	28
Washington	756	31

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table E-3
NUMBER AND PERCENT OF DENTAL HYGIENIST GRADUATES ACTIVE AS HYGIENISTS, BY AGE GROUP: DECEMBER 31, 1977

Age group	Living hygienist graduates		Active hygienists	
	Number	Percent active 1/	Number	Percent distribution
All ages	62,920	51.3	32,200	100.0
Under 25	22,410	70.8	15,860	49.3
25 - 29	12,790	47.3	6,050	18.8
30 - 34	7,510	36.7	2,750	8.5
35 - 39	5,100	38.8	1,980	6.2
40 - 44	4,170	47.9	2,000	6.2
45 - 49	3,050	43.6	1,330	4.1
50 - 54	1,710	42.3	720	2.2
55 - 59	1,810	31.3	570	1.8
60 and over	4,370	21.4	940	2.9

1/ Percentages of active hygienists by age group were derived from a National Survey of Licensed Dental Hygienists conducted in 1966-1967.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table E-4
ESTIMATED NUMBER OF ACTIVE DENTAL ASSISTANTS AND NUMBER PER 100 ACTIVE DENTISTS: SELECTED YEARS 1950-1977

Year	Number of active assistants	Number per 100 active dentists
1950	55,200	70
1955	63,250	75
1960	74,000	82
1965	87,350	91
1970	112,000	110
1975	134,400	120
1976	140,300	122
1977	144,700	123

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry

Table H-5

ESTIMATED NUMBER OF ACTIVE DENTAL ASSISTANTS AND NUMBER PER 100 ACTIVE CIVILIAN DENTISTS, BY REGION, DIVISION, AND STATE: DECEMBER 31, 1977

Geographic area	Number of active assistants	Number per 100 active civilian dentists
UNITED STATES	130,300 1/	123
NORTHEAST	30,349	97
New England	7,837	107
Connecticut	1,900	99
Maine	506	112
Massachusetts	4,221	110
New Hampshire	490	111
Rhode Island	565	123
Vermont	255	96
Middle Atlantic	22,612	94
New Jersey	5,867	135
New York	11,757	87
Pennsylvania	4,988	80
NORTH CENTRAL	36,116	128
East North Central	24,646	125
Illinois	6,008	103
Indiana	2,535	122
Michigan	6,340	142
Ohio	6,439	132
Wisconsin	3,344	131
West North Central	11,448	137
Iowa	1,584	137
Kansas	1,691	146
Minnesota	3,633	153
Missouri	2,904	130
Nebraska	1,094	125
North Dakota	307	104
South Dakota	423	144
SOUTH	37,510	120
South Atlantic	19,721	131
Delaware	411	164
District of Columbia	736	112
Florida	5,232	134
Georgia	2,631	136
Maryland	2,831	121
North Carolina	2,887	146
South Carolina	1,371	134
Virginia	3,099	130
West Virginia	723	114
East South Central	6,897	132
Alabama	1,700	144
Kentucky	1,574	116
Mississippi	933	130
Tennessee	2,690	137
West South Central	10,892	128
Arkansas	959	140
Louisiana	1,596	108
Oklahoma	1,456	135
Texas	6,881	131
WEST	34,127	141
Mountain	7,125	138
Arizona	1,534	141
Colorado	2,000	135
Idaho	604	143
Montana	449	120
Nevada	436	139
New Mexico	739	154
Utah	1,099	137
Wyoming	244	122
Pacific	27,002	141
Alaska	256	121
California	20,957	145
Hawaii	616	107
Oregon	2,017	123
Washington	3,556	145

1/ This number excludes 6,400 dental assistants working in the military.

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table E-6
ESTIMATED NUMBER OF ACTIVE DENTAL LABORATORY TECHNICIANS AND NUMBER PER 100 ACTIVE DENTISTS: SELECTED YEARS 1950-1977

Year	Number of active technicians	Number per 100 active dentists
1950	15,000	18.9
1955	16,870	20.0
1960	19,000	21.1
1965	24,250	25.3
1970	30,670	30.0
1975	41,600	37.1
1976	43,400	37.7
1977	45,100	38.3

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

Table E-7

ESTIMATED NUMBER OF ACTIVE DENTAL LABORATORY TECHNICIANS AND NUMBER PER 100 ACTIVE CIVILIAN DENTISTS, BY TYPE OF WORKPLACE AND BY REGION, DIVISION, AND STATE: DECEMBER 31, 1977

Geographic area	Number of active technicians	Type of workplace		Number per 100 active civilian dentists
		Dental laboratory	Dentist office	
UNITED STATES	45,100	36,700	8,400	40
NORTHEAST	12,820	11,042	1,778	41
New England	2,771	2,369	402	38
Connecticut	657	564	93	34
Maine	158	129	29	35
Massachusetts	1,507	1,309	198	39
New Hampshire	162	150	12	37
Rhode Island	243	185	58	53
Vermont	44	32	12	17
Middle Atlantic	10,049	8,673	1,376	42
New Jersey	1,771	1,578	193	41
New York	6,011	5,794	617	44
Pennsylvania	2,267	1,701	566	37
NORTH CENTRAL	10,684	8,740	1,944	39
East North Central	7,320	5,960	1,360	37
Illinois	2,002	1,640	362	34
Indiana	863	711	152	42
Michigan	1,971	1,708	263	44
Ohio	1,692	1,284	408	35
Wisconsin	792	617	175	31
West North Central	3,364	2,780	584	40
Iowa	396	326	70	32
Kansas	571	489	82	56
Minnesota	883	790	93	37
Missouri	947	725	222	42
Nebraska	364	276	88	42
North Dakota	114	108	6	39
South Dakota	89	66	23	30
SOUTH	10,539	8,450	2,089	36
South Atlantic	5,746	4,638	1,108	38
Delaware	137	108	29	34
District of Columbia	145	87	58	22
Florida	1,550	1,153	397	40
Georgia	1,127	946	181	38
Maryland	1,130	996	134	48
North Carolina	778	685	93	39
South Carolina	253	177	76	25
Virginia	331	226	105	14
West Virginia	295	260	35	46
East South Central	1,747	1,356	391	34
Alabama	539	422	117	46
Kentucky	360	261	99	27
Mississippi	183	148	35	26
Tennessee	665	525	140	34
West South Central	3,046	2,456	590	36
Arkansas	210	163	47	31
Louisiana	487	399	88	33
Oklahoma	347	277	70	32
Texas	2,002	1,617	385	38
WEST	11,057	8,468	2,589	46
Mountain	1,641	1,326	315	32
Arizona	450	386	64	42
Colorado	420	321	99	28
Idaho	123	105	18	29
Montana	73	61	12	18
Nevada	127	92	35	42
New Mexico	161	120	41	33
Utah	202	179	23	25
Wyoming	85	62	23	42
Pacific	9,416	7,142	2,274	49
Alaska	32	26	6	15
California	7,509	5,702	1,807	53
Hawaii	225	202	23	39
Oregon	650	510	140	40
Washington	1,000	702	298	41

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry.

F. EDUCATION OF ALLIED DENTAL PERSONNEL

Dental Hygienist Students

The number of accredited dental hygienist training programs, and their student enrollments, have increased greatly over the figures for previous decades. During the period 1950-1977, the number of dental hygienist training programs increased seven-fold (Table F-1). In 1950, there were only 26 programs, with a total enrollment of 1,454 students. By 1977, there were 186 programs, with a total student enrollment of 10,815. Since 1950, first-year students increased by about 4,750, to attain an enrollment of 5,614 first-year students by 1977. The greater proportion of these increases occurred from the late 1960's onward.

During the period 1961 through 1977, dental hygienist training programs have produced over 45,000 graduates. Over two-thirds of that total, some 31,000, were graduated in the eight years from 1970 through 1977. In 1977, there were 4,847 hygienist graduates, almost twice as many as the number of graduates in 1970.

In 1977, 48 States and the District of Columbia had programs for training dental hygienists. The number of programs, students, and graduates for each State are given in Table F-2. New York was the leading producer of dental hygienist graduates with 421; California was second with 302. Between 200 and 300 hygienists each were graduated in Michigan, Texas, Illinois, Ohio, and Massachusetts. The training programs in these seven States account for two-fifths of all dental hygienists graduated in 1977. Ten other States each had between 100 and 199 dental hygienist graduates. However, 19 States and the District of Columbia each graduated fewer than 50.

Dental Assistant Students

Dental assistant training programs and the annual number of students and graduates have increased greatly in the past decade. The number of accredited dental assistant training programs has increased from 64 in 1965 to 273 in 1977--more than four-fold (Table F-3).

The 1977 total enrollment of 9,429 students represents considerably more than a three-fold increase since 1965. Over the same period, first-year students increased by some 6,000, to attain an enrollment of 8,234 first-year students.

Close to 50,000 dental assistants graduated during the period 1966 through 1977, of whom three of five (59 percent) are accounted for by the last five graduating classes. The number of graduates in 1977 was 6,502, or more than four times the number graduated in 1966.

The total and first-year enrollments and the number of graduates in 1977 are given, by State, in Table F-4. Dental assistants were graduated from 48 States, the District of Columbia, and Puerto Rico.

California is by far the leading producer of dental assistants. With its 36 training programs and 847 graduates in 1977, it greatly outnumbers the second-ranked State, Texas, which had less than half as many training programs and 517 graduates. In close order as the next leading producers of dental assistants are four States with more than 300 graduates each--Massachusetts, North Carolina, Minnesota, and Illinois. Quite a number of jurisdictions produce only a small number of graduates; 17 States, the District of Columbia, and Puerto Rico each graduated less than 50 dental assistants.

Dental Laboratory Technician Students

In 1965, there were only six accredited dental laboratory technician training programs, with a total enrollment of 342 students (Table F-5). In 1977, there were 49 programs, with a total enrollment of 2,481 students. First-year enrollments increased over seven-fold since 1965, to attain a total of 1,410 students in 1977. From 1966 through 1977, dental laboratory technician training programs produced some 6,750 graduates, of whom more than half graduated in the past four years. In 1977, the graduate total reached 1,070.

In 1977, 28 States had training programs for dental laboratory technicians (Table F-6). These programs are thinly spread over the Nation; only four States--California, Texas, Georgia, and Florida--had more than two programs. In terms of the number of 1977 graduates, California was first with 184 and Texas was second with 167. Only two other States--New York and Georgia--had more than 100 graduates. Twenty States each graduated 30 or less dental laboratory technicians.

Minority Auxiliary Students

Table F-7 presents the number and percentage of minority students in the first year of dental auxiliary training programs in the academic years 1972-73 through 1977-78. Blacks have been consistently the largest group of minority students for all three categories of dental auxiliaries, followed by Hispanics and Orientals, with American Indians as the smallest minority.

The number of first-year minority students in dental hygiene training programs in 1977-78 was 232, about 4 percent of all first-year hygienist students--a proportion which has been generally maintained since 1972-73. In dental assistant training programs, first-year minority students rose from 569 to 984 between 1972-73 and 1977-78, an increase from 10 to 13 percent in the proportion of these students to the total first-year dental assistant enrollment. In the academic year 1977-78, there were 245 first-year minority students of dental laboratory technology. This is 20 percent of the total first-year enrollment in dental technology, a slight proportionate decline from the 23 percent in 1972-73.

Auxiliary Students, by Sex

With regard to distribution by sex, enrollments in both dental hygiene and dental assisting programs have traditionally been overwhelmingly female, and have remained so. In academic year 1977-78, only 0.9 percent of first-year dental hygienist students were male, and only 0.6 percent of first-year dental assistant students were male. On the other hand, in recent years females have come to comprise a considerable proportion of the students in training courses for the traditionally-male occupation of dental laboratory technician. In academic year 1977-78, the 479 females enrolled in first-year dental technology classes constituted 39 percent, an increase from the 27 percent in 1973-74.

Dental Auxiliary Applicants

Table F-8 shows that, in 1976, there were far more applicants for dental hygiene training (27,921) than for training in dental assisting and dental laboratory technology combined (17,758). However, only 58 percent of dental hygiene applicants qualified for admission and only one in five (21 percent) were actually offered admission. In contrast, 51 percent of dental laboratory technology applicants and 57 percent of dental assisting applicants were offered admission.

Table F-1

NUMBER OF DENTAL HYGIENIST TRAINING PROGRAMS, STUDENTS, AND GRADUATES: SELECTED ACADEMIC YEARS 1950-51 THROUGH 1977-78

Academic year	Number of programs	Number of students		Number of graduates
		Total	First year	
1950-51	26	1,454	862	632
1955-56	33	2,009	1,100	902
1960-61	37	2,497	1,440	1,023
1961-62	43	2,752	1,506	1,219
1962-63	47	3,005	1,697	1,257
1963-64	49	3,278	1,791	1,429
1964-65	53	3,502	1,923	1,492
1965-66	56	3,863	2,070	1,650
1966-67	58	4,041	2,134	1,739
1967-68	67	4,309	2,385	1,834
1968-69	85	5,187	2,870	2,231
1969-70	100	5,931	3,299	2,465
1970-71	121	6,854	3,852	2,903
1971-72	133	8,061	4,564	3,410
1972-73	148	9,193	4,815	4,137
1973-74	157	9,400	4,995	4,313
1974-75	160	9,774	5,118	4,568
1975-76	173	10,084	5,335	4,616
1976-77	179	10,654	5,598	4,847
1977-78	186	10,815	5,614	-- 1/

1/ Data are not available at this time.

SOURCE: American Dental Association, Council on Dental Education. Dental Students' Register for each selected academic year from 1950-51 through 1966-67. Annual Report on Dental Auxiliary Education for all subsequent academic years.

Table F-2
NUMBER OF DENTAL HYGIENIST TRAINING PROGRAMS, STUDENTS, AND GRADUATES, BY STATE: 1977

State	Number of programs	Number of students as of October 15, 1977		Number of graduates 1976-77
		Total	First year	
Total	186	10,815	5,614	4,847
Alaska	1	16	8	8
Arizona	2	87	43	44
Arkansas	1	60	30	30
California	13	599	297	302
Colorado	3	86	51	34
Connecticut	2	226	116	88
Delaware	1	25	13	-
District of Columbia	1	28	15	16
Florida	8	452	241	173
Georgia	7	342	85	157
Hawaii	1	40	20	20
Idaho	1	56	28	25
Illinois	8	527	275	252
Indiana	5	211	107	102
Iowa	3	151	77	72
Kansas	2	109	56	48
Kentucky	4	137	55	81
Louisiana	3	185	93	85
Maine	2	145	78	69
Maryland	3	228	118	113
Massachusetts	6	413	218	201
Michigan	9	682	356	281
Minnesota	4	464	207	171
Mississippi	1	46	27	20
Missouri	3	175	90	90
Montana	1	27	12	18
Nebraska	1	40	20	20
New Hampshire	1	48	26	24
New Jersey	6	324	164	153
New Mexico	1	47	24	25
New York	10	904	469	421
North Carolina	7	387	207	154
North Dakota	1	64	32	27
Ohio	9	530	314	248
Oklahoma	2	72	36	28
Oregon	5	192	98	91
Pennsylvania	6	409	215	182
Rhode Island	1	41	20	20
South Carolina	4	138	78	59
South Dakota	1	62	32	31
Tennessee	4	236	127	92
Texas	13	677	345	263
Utah	1	40	20	19
Vermont	1	77	38	34
Virginia	3	156	79	73
Washington	6	263	140	130
West Virginia	3	225	113	82
Wisconsin	4	321	172	148
Wyoming	1	45	29	23

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Auxiliary Education, 1977-78.

Table F-3
NUMBER OF DENTAL ASSISTANT TRAINING PROGRAMS, STUDENTS, AND GRADUATES: ACADEMIC YEARS 1965-66 THROUGH 1977-78

Academic year	Number of programs	Number of students		Number of graduates
		Total	First year	
1965-66	64	2,798	2,210	1,593
1966-67	81	3,159	2,518	1,963
1967-68	101	3,819	3,118	2,302
1968-69	134	4,475	3,625	2,715
1969-70	154	5,074	4,206	2,955
1970-71	165	5,812	4,841	3,922
1971-72	182	7,491	6,361	4,814
1972-73	201	7,985	6,671	5,297
1973-74	220	8,595	7,272	5,684
1974-75	237	9,024	7,858	5,972
1975-76	250	9,306	8,119	6,208
1976-77	262	9,515	8,325	6,502
1977-78	273	9,429	8,234	-- 1/

1/ Data are not available at this time.

SOURCE: American Dental Association, Council on Dental Education. Dental Students' Register for the academic years 1965-66 and 1966-67. Annual Report on Dental Auxiliary Education for all subsequent academic years.

Table P-4
NUMBER OF DENTAL ASSISTANT TRAINING PROGRAMS, STUDENTS, AND GRADUATES, BY STATE: 1977

State	Number of programs	Number of students as of October 15, 1977		Number of graduates 1976-77
		Total	First year	
Total	273	9,429	8,234	6,582
Alabama	4	91	91	57
Alaska	1	15	15	7
Arizona	2	68	64	56
Arkansas	1	20	20	19
California	36	1,836	1,234	847
Colorado	4	146	107	84
Connecticut	4	63	63	70
Delaware	1	31	18	18
District of Columbia	1	31	31	33
Florida	12	282	282	247
Georgia	2	63	63	42
Hawaii	1	21	21	17
Idaho	2	45	45	34
Illinois	17	468	437	350
Indiana	6	115	115	115
Iowa	8	198	198	157
Kansas	3	47	47	62
Kentucky	4	124	124	65
Louisiana	1	13	13	13
Maine	1	10	10	-
Maryland	6	229	193	122
Massachusetts	15	567	543	455
Michigan	15	550	399	279
Minnesota	14	522	469	408
Mississippi	1	26	26	28
Missouri	9	227	209	164
Montana	1	34	34	19
Nebraska	5	133	122	132
New Hampshire	1	16	16	12
New Jersey	5	132	132	138
New Mexico	3	40	40	38
New York	7	312	260	202
North Carolina	10	748	748	441
North Dakota	1	18	18	18
Ohio	3	79	79	69
Oregon	6	139	139	115
Pennsylvania	7	229	182	138
Rhode Island	1	29	29	19
South Carolina	6	153	134	93
South Dakota	1	42	42	38
Tennessee	4	89	80	78
Texas	14	604	543	317
Utah	1	35	35	54
Vermont	2	52	31	27
Virginia	5	138	136	91
Washington	9	285	285	246
West Virginia	1	16	16	16
Wisconsin	6	253	253	207
Wyoming	1	10	10	4
Puerto Rico	1	31	31	39

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Auxiliary Education, 1977-78.

Table F-5

NUMBER OF DENTAL LABORATORY TECHNICIAN TRAINING PROGRAMS, STUDENTS, AND GRADUATES: ACADEMIC YEARS 1965-66 THROUGH 1977-78

Academic year	Number of programs	Number of students		Number of graduates
		Total	First year	
1965-66	6	342	194	142
1966-67	10	510	321	162
1967-68	15	729	437	325
1968-69	19	803	462	357
1969-70	23	965	596	359
1970-71	26	1,113	673	447
1971-72	31	1,478	923	546
1972-73	32	1,686	1,064	682
1973-74	34	1,933	1,184	839
1974-75	38	2,175	1,196	836
1975-76	40	2,234	1,345	991
1976-77	48	2,389	1,313	1,070
1977-78	49	2,481	1,410	-- 1/

1/ Data are not available at this time.

SOURCE: American Dental Association, Council on Dental Education. Dental Students' Register for the academic years 1965-66 and 1966-67. Annual Report on Dental Auxiliary Education for all subsequent academic years.

Table F-6
NUMBER OF DENTAL LABORATORY TECHNICIAN TRAINING PROGRAMS, STUDENTS, AND GRADUATES, BY STATE: 1977

State	Number of programs	Number of students as of October 15, 1977		Number of graduates 1976-77
		Total	First year	
Total	49	2,481	1,410	1,070
Alabama	1	24	24	12
California	8	438	248	184
Florida	3	124	80	45
Georgia	3	136	109	115
Illinois	2	159	81	54
Indiana	2	51	24	17
Iowa	1	42	25	11
Kentucky	1	47	25	19
Louisiana	1	22	12	11
Maryland	2	92	45	27
Massachusetts	2	42	25	15
Michigan	1	77	43	35
Minnesota	2	77	33	32
Nebraska	1	24	14	12
New Jersey	1	41	24	10
New Mexico	1	14	8	5
New York	1	154	94	120
North Carolina	1	73	40	25
Ohio	1	65	41	17
Oregon	1	44	26	18
Pennsylvania	1	34	20	14
South Carolina	2	64	39	23
South Dakota	1	26	17	9
Tennessee	1	31	20	9
Texas	3	388	187	167
Virginia	2	72	41	30
Washington	2	76	43	28
Wisconsin	1	42	22	6

SOURCE: American Dental Association, Council on Dental Education. Annual Report on Dental Auxiliary Education, 1977-78.

Table F-7

MINORITY STUDENTS IN FIRST YEAR OF DENTAL AUXILIARY TRAINING PROGRAMS: ACADEMIC YEARS 1972-73 THROUGH 1977-78 1/

Academic year	Dental hygiene		Dental assisting 2/		Dental laboratory technology 2/	
	Minority students	Percent minority of total first-year students	Minority students	Percent minority of total first-year students	Minority students	Percent minority of total first-year students
1972-73	190	4.1	569	10.0	213	22.6
1973-74	221	4.6	685	10.7	207	18.8
1974-75	227	4.6	770	11.5	225	19.9
1975-76	238	4.7	742	10.0	193	17.5
1976-77	220	4.1	928	12.2	185	16.9
1977-78	232	4.3	984	13.4	245	19.8

1/ Excludes University of Puerto Rico and also some programs for which minority data were not reported.

2/ Excludes training programs at Sheppard Air Force Base.

SOURCE: American Dental Association, Council on Dental Education. Minority Report; Supplement 1 to the Annual Report on Dental Auxiliary Education 1977-78. Also prior annual reports.

Table F-8
NUMBER OF APPLICANTS AND NUMBER AND PERCENT OFFERED ADMISSION, BY TYPE OF DENTAL AUXILIARY TRAINING PROGRAM: ACADEMIC YEAR 1976-77

Type of training program	Number of applicants	Applicants meeting minimum admission standards		Applicants offered admission	
		Number	Percent	Number	Percent
Dental hygiene	27,921	16,136	57.8	5,919	21.2
Dental assisting	15,138	11,393	75.3	8,579	56.7
Dental laboratory technology	2,620	1,788	68.2	1,344	51.3

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data provided by the American Dental Association, Council on Dental Education. Analysis of Applicants and First Year Enrollment; Supplement 3, Dental Hygiene, Supplement 4, Dental Assisting, and Supplement 5, Dental Laboratory Technology, to Annual Report on Dental Auxiliary Education 1976-77.

G. UTILIZATION OF DENTAL SERVICES

In general, the percent of the population which has visited the dentist within a year has increased from 42 percent in 1963-64 to approximately 50 percent for most of the 1970's (Table G-1). Over this period, the average number of dental visits per person per year has fluctuated very little, ranging only between 1.5 and 1.7; it was 1.6 in the years 1975-1977.

Demographic Variation in Dental Visits

When these statistics for 1977 are examined by certain demographic characteristics, a striking difference is seen on the basis of color; 52 percent of white persons visited a dentist within a year and only 35 percent of non-whites (Table G-2). There was an even greater range of difference on the bases of family income and educational level of the head of the family. Among families with an income of less than $5,000 a year, the proportion of persons visiting the dentist within a year was 34 percent. Each higher income level brought a higher percent of persons with dental visits; at the income level of $15,000 or more, the percent was 62, almost double that of the lowest income level. There was a similar range on the basis of the education of the head of the family--30 percent if the head of the family had less than nine years of education and, at the other end of this spectrum, 64 percent of persons with dental visits within a year where heads of families had 13 or more years of education.

About 55 percent of persons 17 to 24 years of age visited a dentist within a year--the highest proportion for any age group. Only 31 percent of persons 65 or over visit the dentist within a year, the lowest percent of any age group. The variation in dental visits is rather small between the sexes--51 percent of females and 48 percent of males visit a dentist within a year.

As might be expected, variations by demographic characteristics in the average number of dental visits per person per year rather closely follow the variations recorded for the percent of persons with dental visits within a year.

Geographic Variation in Dental Visits

There is a direct relationship of the relative supply of dentists in an area--measured in persons-per-dentist ratios--with the extent to which dentist services are used, whether measured in the percent of persons in the area who visited a dentist within a year or in terms of dental visits per person per year. This statement holds true whether the areas compared are geographic regions, metropolitan vs. non-metropolitan areas, or States grouped according to their persons-per-dentist ratios.

Table G-3 shows that the Northeast region, which has the most favorable persons-per-dentist ratio, also fares best in utilization of dental

services, as measured both in the percent of persons in the region who visited a dentist within a year (51 percent) and in the average number of dental visits per person per year (1.9). As a region's persons-per-dentist ratio is less favorable, a smaller proportion of the population visits the dentist and the average annual number of dental visits per person also declines. The South was lowest on both counts with, respectively, 41 percent and 1.2.

The same progression prevails when metropolitan and non-metropolitan areas are compared. Metropolitan areas, with the more favorable persons-per-dentist ratio, also have the better dental visit records, with 49 percent of the population with a dental visit within a year and 1.8 average dental visits per person per year. At the other extreme are the rural areas, with 42 percent of persons with dental visits within a year and less than one dental visit per person per year.

The same relationship is also shown in Table G-4, which places the States in four groups according to their persons-per-dentist ratios. The group of States with the best ratio (under 1,800) had both the highest proportion of persons with a dental visit within a year (49 percent) and the highest average number of dental visits per person (1.7). These figures decreased with each successive State group which had less favorable ratios. For the group of States with 2,500 or more persons per dentist, 41 percent of the persons received dental services within a year and the average number of dental visits per person per year was only 1.1.

Thus, the statistics indicate that a relatively larger supply of dentists is directly and consistently related to more dental visits, no matter what geographic areas are compared.

Table G-5 shows the variation among the States in the percent of persons with dental visits within a year and the average number of dental visits per person per year. The States with the best statistics on both counts are Connecticut and New Hampshire, with 53 percent and 1.9 respectively, followed closely by Massachusetts with 52 percent and 1.9. The jurisdiction with the lowest dental-visit figures is the District of Columbia, with 33 percent and 0.8. The State with the lowest figures is Mississippi, with 36 percent and 0.9. However, a high proportion of the States record dental-visit statistics close to the national averages of 46 percent and 1.5.

Dental Visits by Type of Service

Table G-6 shows some changes between 1964 and 1971 in the percent distribution of dental visits according to the type of dental service provided to patients. Between those years, the percent of visits for the purpose of filling teeth declined from 38 to 30 percent, and for extractions and other dental surgery the decline was from 15 to 12 percent. According to the data, the percent of dental visits for the

purpose of oral examinations, cleaning teeth, and straightening teeth all increased somewhat. The percent of visits for the purpose of denture work and for gum (periodontal) treatment remained virtually the same between 1964 and 1971.

When the percent distribution of dental visits by type of dental services in the year 1971 are examined by sex, it is seen that there are no great percentage differences between male and female for any dental procedure (Table G-7). When examined by age groups, the percent distribution of dental visits for some dental services vary considerably. Some of these are quite obvious--percent of visits for denture work increases steeply with age, until over one-third of the visits of persons 65 years and over involve denture work. Dental visits for the purpose of straightening teeth are recorded almost exclusively for persons under 25 years of age. There is a more moderate range among age groups in the percent of visits for some other dental services, such as examinations, fillings, and extractions; for cleaning teeth and gum treatment the variation among age groups is minimal.

Table G-1

PERCENT OF PERSONS WITH ONE OR MORE DENTAL VISITS WITHIN A YEAR AND AVERAGE NUMBER OF DENTAL VISITS PER PERSON PER YEAR: 1963-64 AND 1969 THROUGH 1977

Year	Percent of persons with dental visits within a year	Average number of dental visits per person per year
1963-64	42.0	1.6
1969	45.0	1.5
1970	46.8	1.5
1971	47.1	1.5
1972	47.2	1.5
1973	48.9	1.6
1974	49.3	1.7
1975	50.3	1.6
1976	48.7	1.6
1977	49.7	1.6

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Current Estimates from the Health Interview Survey, United States, 1976; PHS Publication Series 10, No. 119, November 1977. Also prior issues in the same series, and provisional unpublished data for 1977.

Table G-2

PERCENT OF PERSONS WITH ONE OR MORE DENTAL VISITS WITHIN A YEAR AND AVERAGE NUMBER OF DENTAL VISITS PER PERSON PER YEAR, BY DEMOGRAPHIC CHARACTERISTICS: 1977

Demographic characteristics	Percent of persons with dental visits within a year	Average number of dental visits per person per year
All persons	49.7	1.6
Sex		
Male	48.3	1.5
Female	51.1	1.7
Age group		
Under 17 years	51.0	1.5
17-24 years	55.2	1.6
25-44 years	53.5	1.7
45-64 years	48.7	1.8
65 years and over	31.4	1.3
Color		
White	51.9	1.7
All other	35.4	1.0
Family income		
Less than $4,999	34.0	1.1
$ 5,000-9,999	38.1	1.2
10,000-14,999	46.8	1.4
15,000 or more	61.9	2.0
Education of head of family		
Less than 9 years	30.2	1.0
9-11 years	39.8	1.4
12 years	51.9	1.6
13 years or more	64.1	2.1

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Provisional data, unpublished.

Table G-3
PERSONS-PER-DENTIST RATIOS, BY GEOGRAPHIC REGION AND PLACE OF RESIDENCE, RELATED TO DENTAL VISITS

Geographic area	Average persons-per-dentist ratio in 1977	Dental visits, 1969-1971: Percent of persons with dental visits within a year	Dental visits, 1969-1971: Average number of dental visits per person per year
United States	1,905	46.3	1.5
Geographic region			
Northeast	1,562	51.2	1.9
West	1,595	48.1	1.8
North Central	2,053	47.4	1.4
South	2,396	40.5	1.2
Place of residence			
Metropolitan areas	1,701	49.4	1.8
Non-metropolitan areas:			
Non-farm	2,575	43.1	1.2
Rural	3,664	41.9	0.9

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on unpublished 1977 data from the American Dental Association, Bureau of Economic Research and Statistics, and on data from National Center for Health Statistics, State Estimates of Disability and Utilization of Medical Services: United States, 1969-71; DHEW Publication No. (HRA) 77-1241, January 1977.

Table G-4
PERSONS-PER-DENTIST RATIOS, BY STATE GROUP, RELATED TO DENTAL VISITS

State group determined by persons-per-dentist ratio	Number of States in group	Average persons-per-dentist ratio in 1977	Dental visits, 1969-1971: Percent of persons with dental visits within a year	Dental visits, 1969-1971: Average number of dental visits per person per year
United States	50	1,905	46.3	1.5
Under 1,800	13	1,513	49.2	1.7
1,800-2,099	13	1,936	48.0	1.5
2,100-2,499	13	2,217	44.7	1.2
2,500 and over	11	2,741	40.8	1.1

SOURCE: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on unpublished 1977 data from the American Dental Association, Bureau of Economic Research and Statistics, and on data from National Center for Health Statistics, State Estimates of Disability and Utilization of Medical Services: United States, 1969-71; DHEW Publication No. (HRA) 77-1241, January 1977.

Table G-5

PERCENT OF PERSONS WITH ONE OR MORE DENTAL VISITS WITHIN A YEAR AND AVERAGE NUMBER OF DENTAL VISITS PER PERSON PER YEAR, BY STATE: 1969-1971

State	Percent of persons with dental visits within a year	Average number of dental visits per person per year
United States	46.3	1.5
Alabama	38.9	1.0
Alaska	47.6	1.6
Arizona	47.4	1.7
Arkansas	38.7	1.1
California	48.2	1.7
Colorado	49.0	1.7
Connecticut	52.9	1.9
Delaware	43.2	1.2
District of Columbia	33.2	0.8
Florida	40.4	1.1
Georgia	40.2	1.1
Hawaii	39.7	1.3
Idaho	47.4	1.6
Illinois	47.0	1.3
Indiana	48.2	1.4
Iowa	47.1	1.3
Kansas	46.8	1.3
Kentucky	41.0	1.1
Louisiana	38.5	1.0
Maine	51.2	1.8
Maryland	42.9	1.2
Massachusetts	52.4	1.9
Michigan	47.9	1.3
Minnesota	48.0	1.3
Mississippi	36.1	0.9
Missouri	45.7	1.3
Montana	47.4	1.7
Nebraska	46.5	1.3
Nevada	49.4	1.7
New Hampshire	52.8	1.9
New Jersey	51.5	1.8
New Mexico	46.4	1.6
New York	50.4	1.8
North Carolina	40.3	1.1
North Dakota	45.5	1.3
Ohio	48.0	1.4
Oklahoma	41.2	1.1
Oregon	48.8	1.7
Pennsylvania	50.9	1.8
Rhode Island	51.9	1.8
South Carolina	39.0	1.0
South Dakota	44.4	1.2
Tennessee	40.6	1.1
Texas	41.7	1.1
Utah	49.6	1.7
Vermont	51.4	1.8
Virginia	41.8	1.1
Washington	49.2	1.7
West Virginia	41.5	1.1
Wisconsin	48.1	1.4
Wyoming	47.5	1.7

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. State Estimates of Disability and Utilization of Medical Services: United States, 1969-71; DHEW Publication No. (HRA) 77-1241, January 1977.

Table C-6
PERCENT DISTRIBUTION OF DENTAL VISITS BY TYPE OF SERVICE PROVIDED TO PATIENTS: 1963-64 AND 1971

Type of service	Percent distribution 1/	
	1963-64	1971
Examination	21.1	23.8
Cleaning teeth	13.6	17.8
Fillings	37.8	29.7
Denture work	13.2	13.3
Extractions and other surgery	15.0	12.3
Straightening teeth	5.0	8.5
Gum treatment	3.6	3.3

1/ The percents add to more than 100 because more than one type of service was performed during some visits.

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Volume of Dental Visits, United States, July 1963 - June 1964; PHS Publication Series 10, No. 23, October 1965, and also Current Estimates from the Health Interview Survey, United States, 1971; PHS Publication Series 10, No. 79, February 1973.

Table G-7

PERCENT DISTRIBUTION OF DENTAL VISITS BY TYPE OF SERVICE PROVIDED TO PATIENTS, BY SEX AND AGE GROUP: 1971

Sex and age group	Percent distribution by type of service 1/						
	Examination	Cleaning teeth	Fillings	Denture work	Extractions and other surgery	Straightening teeth	Gum treatment
Total	23.8	17.8	.7	13.3	12.3	8.5	3.3
Male	25.1	17.6	29.6	13.1	13.0	7.4	3.0
Female	22.8	18.0	29.8	13.5	11.8	9.2	3.5
Under 17 years	29.7	17.6	28.1	2.0	8.9	22.8	3.1
17-24 years	25.6	16.2	34.4	6.2	14.3	7.5	2.8
25-44 years	22.8	17.9	32.7	15.1	15.2	*	3.7
45-64 years	19.1	19.1	27.0	25.2	12.2	*	3.8
65 years and over	12.4	18.4	23.5	36.3	12.2	*	*

1/ The percents add to more than 100 because more than one type of service was performed during some visits.

* Data omitted because inadequate to meet standards of reliability.

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Current Estimates from the Health Interview Survey, United States, 1971; PHS Publication Series 10, No. 79, February 1973.

H. DENTAL AND MEDICAL EXPENDITURES

Trends in Total Expenditures

During recent decades, expenditures for health generally, and for dental health specifically, have increased fairly steadily, both in absolute sums and in percent of the gross national product (GNP). In fiscal year 1950, the Nation spent 12 billion dollars on all health care, representing 4.5 percent of GNP (Table H-1). By 1970, the amount had increased to some 69 billion dollars, representing 7.2 percent of GNP. By fiscal year 1977, national health expenditures had increased to over 162 billion dollars, which represents a rise in the proportion of GNP to 8.8 percent. National dental expenditures followed a similar pattern, rising from a national expenditure in fiscal year 1950 of 940 million dollars, 0.35 percent of GNP, to an expenditure close to four and a half billion dollars in fiscal year 1970, or 0.46 percent of GNP, and reaching about 10 billion dollars in fiscal year 1977, representing 0.54 percent of a GNP approaching two trillion dollars.

When the Nation's health expenditures are examined by the amounts spent for major components of health care, it is seen that the percent of health expenditures represented by dentists' services has declined slightly over the years. In fiscal year 1950, the 940 million dollars for dental expenditures accounted for 7.8 percent of the health-expenditure dollar; by fiscal 1970, the almost four and a half billion spent for dental services represents 6.5 percent of all health expenditures.

In fiscal year 1977, the some 10 billion dollars spent for dentists' services represents a further slight decline to 6.2 percent of the total national health expenditure (Table H-2).

An examination of the percent distribution in fiscal year 1977 for private and public expenditures for each health service component shows that the overwhelming majority of those dentists' services were paid for with private funds. About nine and a half billion dollars in private funds were spent for dentists' services, representing 10 percent of all private health expenditures, contrasted with a half billion from public funds, or less than one percent of public health expenditures. No other major category of health expenditure is as disproportionate between private and public expenditures. In contrast, over 11 percent of public health expenditures go for payment of physicians' services; however, private expenditures for physicians' services still exceed public expenditures by more than 3 to 1.

Trends in Per Capita Expenditures

National per capita expenditures for health care increased from $78.35 per person in fiscal year 1950 to $333.57 in fiscal year 1970 to $736.92 in fiscal year 1977 (Table H-3). Over the same years, per capita

expenditures for dentists' services increased from $6.12 to $21.56 to $45.11. Per capita expenditures for physicians' services increased at a slightly steeper rate, from $17.52 in fiscal year 1950 to $64.80 in fiscal year 1970 to $145.84 in fiscal year 1977. The rise in per capita expenditure for hospital care was considerably steeper--from $24.09 in fiscal year 1950 to $124.74 in fiscal year 1970 to $297.38 in fiscal year 1977, more than a 12-fold increase over the period.

Consumer Price Index

The consumer price index, assigned a base 100.0 for 1967 price levels, rose to 181.5 by 1977 (Table H-4). The price index level for all health care items rose considerably more, from 100.0 to 202.4 over the same period. Concurrently, the price level index for all dentists' fees rose to 185.1, compared with the higher levels of 206.0 for physicians' fees, and 299.5 for certain hospital room rates, the latter representing by far the largest price level increase for any of the given health care components over the period. Among specific dental procedures, the lowest relative increase since 1967 was for full upper dentures and the highest was for fillings, attaining a 1977 price index of 171.0 and 191.5 respectively.

Coverage and Expenditures of Dental Care Plans

Private dental care plans represented a comparatively minor aspect of health care insurance in the mid-1960's. In 1965, only about three million beneficiaries were enrolled in such plans, representing 1.6 percent of the civilian population (Table H-5). By 1970, coverage had increased about four times to over 12 million beneficiaries, representing 6 percent of the civilian population. Steadily increasing numbers were enrolled during this decade, so that by 1976, well over 46 million beneficiaries were enrolled in some form of private dental care plan, covering slightly more than one of every five persons in the civilian population (22 percent). However, the number of persons covered by dental insurance still lags behind the 1976 coverage of over 164 million for hospital care (77 percent of the civilian population) and 156 million (73 percent) for in-hospital physician visits.

The expenditures for dental care by private health insurance organizations have greatly increased over recent years, concurrently with the increase in the number of persons covered. In 1970, the total expenditure for dental care by all private health insurance organizations was 240 million dollars (Table H-6). By 1976, this sum had increased to more than one and one-half billion dollars. About two-thirds of this 1976 amount--over a billion dollars--was paid out through commercial insurance companies; in 1970 their expenditure had been 147 million dollars. Over the same period, dental expenditures by dental service corporations increased from 54 million to 285 million dollars, and by Blue Cross-Blue Shield from 3.8 million to over 176 million dollars. A comparatively much slower rate of growth was recorded by employer-employee unions--from 20 million to over 37 million dollars.

Table H-1

NATIONAL HEALTH EXPENDITURES AND DENTAL EXPENDITURES, BY TOTAL AMOUNT AND AS PERCENT OF GROSS NATIONAL PRODUCT: SELECTED FISCAL YEARS 1950-1977

Fiscal year	Gross national product (millions)	National health expenditures		Dental expenditures	
		Total (millions)	Percent of GNP	Total (millions)	Percent of GNP
1950	$ 264,800	$ 12,027	4.5	$ 940	0.35
1955	381,000	17,330	4.5	1,457	0.38
1960	498,300	25,856	5.2	1,944	0.39
1965	658,000	38,892	5.9	2,728	0.41
1970	960,200	69,201	7.2	4,473	0.46
1971	1,019,800	77,162	7.6	4,908	0.48
1972	1,111,800	86,687	7.8	5,364	0.48
1973	1,238,600	95,383	7.7	6,101	0.49
1974	1,361,200	106,321	7.8	6,870	0.50
1975	1,454,500	123,716	8.5	7,870	0.54
1976	1,625,400	141,013	8.7	8,600	0.52
1977 1,2/	1,838,000	162,627	8.8	10,020	0.54

1/ New Federal fiscal year, ending September 30. (Earlier fiscal years ended June 30.)

2/ Preliminary estimates.

SOURCE: U.S. Department of Health, Education, and Welfare, Health Care Financing Administration. Social Security Bulletin 41:3-20, July 1978. Also selected prior issues.

Table H-2
NATIONAL HEALTH EXPENDITURES, BY TYPE OF SERVICE AND BY PRIVATE AND PUBLIC EXPENDITURE: FISCAL YEAR 1977

Type of service	Expenditures (millions)1/			Percent distribution		
	Total	Private	Public	Total	Private	Public
All expenditures	$162,627	$94,185	$68,442	100.0	100.0	100.0
Hospital care	65,627	29,427	36,199	40.3	31.2	53.0
Nursing home care	12,618	5,434	7,184	7.8	5.8	10.5
Physicians' services	32,184	24,360	7,824	19.8	25.8	11.5
Dentists' services	10,020	9,520	500	6.2	10.1	0.7
Other professional services	3,212	2,288	924	2.0	2.4	1.3
Drugs and drug sundries	12,516	11,373	1,143	7.7	12.1	1.7
Eyeglasses and appliances	2,086	1,956	130	1.3	2.1	0.2
Other health services	4,322	1,105	3,217	2.7	1.2	4.7
Administration and public health activities	11,301	5,829	5,472	6.9	6.2	8.0
Research and construction	8,739	2,891	5,848	5.3	3.1	8.4

1/ Preliminary estimates.

SOURCE: U.S. Department of Health, Education, and Welfare, Health Care Financing Administration. Social Security Bulletin 41:3-20, July 1978.

Table H-3
NATIONAL PER CAPITA HEALTH EXPENDITURES,
BY SELECTED TYPE OF SERVICE: SELECTED FISCAL YEARS 1950-1977

Fiscal year	Per capita health expenditures				
	Total 1/	Dentists services	Physicians' services	Hospital care	Other health expenditures
1950	$ 78.35	$ 6.12	$ 17.52	$ 24.09	$ 30.62
1955	103.76	8.72	21.75	34.06	39.26
1960	141.63	10.65	30.57	46.56	53.85
1965	197.75	13.87	42.74	66.87	74.27
1970	333.57	21.56	64.80	124.74	122.47
1971	368.25	23.42	72.05	139.03	133.73
1972	409.71	25.35	78.11	154.64	151.61
1973	447.31	28.61	84.39	169.55	164.77
1974	495.01	31.99	91.92	190.98	180.13
1975	571.21	36.34	110.07	223.36	201.43
1976	637.97	39.38	120.67	253.70	224.21
1977 2,3/	736.92	45.11	145.84	297.38	248.31

1/ Figures for the various health services may not add to totals due to independent rounding.

2/ New Federal fiscal year, ending September 30. (Earlier fiscal years ended June 30.)

3/ Preliminary estimates.

SOURCE: U.S. Department of Health, Education, and Welfare, Health Care Financing Administration. Social Security Bulletin 39:3-21, February 1976; 40:3-22, April 1977; and 41:3-20, July 1978.

Table H-4

U.S. ANNUAL AVERAGE CONSUMER PRICE INDEX FOR SELECTED HEALTH CARE ITEMS: 1967 THROUGH 1977

(Consumer price index for 1967 = base 100)

Year	All consumer items	Health care items						
		All health care items	Dentists' fees				Physicians' fees	Hospital semi-private room rates
			All dental items	Fillings (adult, amalgam, one surface)	Extractions (adult)	Dentures (full upper)		
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	104.2	106.1	105.5	105.4	105.2	106.1	105.6	113.6
1969	109.8	113.4	112.9	113.1	112.9	112.3	112.9	128.8
1970	116.3	120.6	119.4	120.3	118.6	118.3	121.4	145.4
1971	121.3	128.4	127.0	128.0	126.9	124.9	129.8	163.1
1972	125.3	132.5	132.3	133.8	132.2	129.3	133.8	173.9
1973	133.1	137.7	136.4	138.7	135.4	132.6	138.2	182.1
1974	147.7	150.5	146.8	150.2	146.0	140.6	150.9	201.5
1975	161.2	168.6	161.9	166.7	160.9	153.0	169.4	236.1
1976	170.5	184.7	172.2	177.4	171.5	162.3	188.5	268.6
1977	181.5	202.4	185.1	191.5	186.3	171.0	206.0	299.5

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics. Monthly Labor Review 101:84-92, February 1978. Also selected prior issues.

Table H-5
ESTIMATED NUMBER OF BENEFICIARIES UNDER PRIVATE DENTAL CARE PLANS AND PERCENT OF CIVILIAN POPULATION COVERED: 1965 THROUGH 1976

Year	Number of beneficiaries (thousands)	Percent of civilian population covered
1965	3,100	1.6
1966	4,227	2.2
1967	4,679	2.4
1968	5,821	2.9
1969	8,510	4.2
1970	12,210	6.0
1971	15,348	7.5
1972	17,904	8.6
1973	22,008	10.5
1974	32,896	15.6
1975	34,477	16.2
1976	46,578	21.8

SOURCE: U.S. Department of Health, Education, and Welfare, Health Care Financing Administration. Social Security Bulletin 40:3-21, June 1977, and 41:3-16, September 1978.

Table H-6
ESTIMATED EXPENDITURES OF PRIVATE HEALTH INSURANCE ORGANIZATIONS FOR DENTAL CARE: 1970 THROUGH 1976

Type of insurance organization	1970	1971	1972	1973	1974	1975	1976
				(In millions)			
Total	$240.1	$304.3	$389.4	$519.8	$778.4	$1,074.0	$1,609.3
Commercial insurance companies	147.0	194.0	207.0	249.0	332.2	525.0	1,078.5
Dental service corporations	54.0	60.0	130.0	200.2	340.0	362.0	285.0
Blue Cross-Blue Shield	3.8	8.9	13.3	23.0	53.5	131.0	176.6
Independent plans:							
Community	14.0	21.5	19.4	22.8	28.0	26.4	29.5
Employer-employee union	20.0	18.5	18.2	22.6	22.4	27.2	37.6
Private group clinic	1.3	1.4	1.5	2.2	2.3	2.4	2.1

SOURCE: U.S. Department of Health, Education, and Welfare, Health Care Financing Administration. Social Security Bulletin 41:3-16, September 1978. Also selected prior issues.

I. ORAL HEALTH STATUS

Decayed, Missing, and Filled Teeth

One important measure of a person's dental health is the DMF index, or the count of decayed, missing, and filled permanent teeth. The National Center for Health Statistics has compiled provisional data for the years 1971-1974 on the DMF index of the population aged 6 to 74. The national DMF index for those years is 14.1, of which the component parts are 1.3 for decayed teeth, 6.3 for missing teeth, and 6.5 for filled teeth (Table I-1). As between males and females, the respective DMF indexes are fairly similar, with an overall DMF index of 13.4 for males and 14.8 for females. The variation is somewhat greater according to color, with 13.3 for whites and 10.2 for blacks.

As might be expected, the DMF index steadily increases with age. For children 6 to 11 years of age, the DMF index is 1.7, increases to 11.4 for ages 18 to 24, and doubles to 22.2 for persons 65 to 74. For ages 18 to 24, three-fifths of the DMF is represented by filled teeth; for ages 65 to 74, about two-thirds of the DMF is represented by missing teeth.

Periodontal Disease

The condition of the periodontia, or gums, is another important measure of oral health. In the period 1971-1974, almost half of the adult population from 18 to 74 years had periodontal disease, about equally divided between periodontal disease without pockets and the more severe form of periodontal disease with pockets (Table I-2).

The prevalence of this disease is already fairly high at an early age--40 percent of the age group of 18 to 24 years have some periodontal disease, although most of this is without pockets. The prevalence of periodontal disease, and especially of periodontal disease with pockets, increases in the older years. Half of all persons aged 65 to 74 years have periodontal disease with pockets; the overall proportion of this age group with periodontal disease is 63 percent.

There is a notable difference between males and females; 55 percent of males have some periodontal disease, compared to 43 percent of females.

Extent of Edentulousness

Edentulousness, or the total absence of natural teeth, varies considerably by age in the adult population, according to data for the years 1971-1974. Among persons 18 to 44 years old, 6 percent have one edentulous arch and 4 percent have lost all teeth from both arches (Table I-3). Among those 45 to 64 years old, 37 percent are edentulous in one or both arches. In the age group of 65 to 74 years, 46 percent have lost all teeth and another 15 percent have lost all teeth in one of the dental arches.

Females are edentulous to a somewhat greater extent than are males. In the age range of 18 to 74 years, 26 percent of females have one or both arches edentulous, compared with 21 percent for males.

Fluoridation of Water Supplies

Fluoridation of community water supplies has long been known to be a very effective and safe measure for reducing the incidence of tooth decay. By the end of 1975, the population receiving fluoridated water numbered 102.9 million, of whom 10.7 million were served with water containing adequate fluoride provided by nature and 92.2 million were served with water in which the fluoride content was added or adjusted by man (Table I-4). Virtually one half (49 percent) of the total United States population of 209.8 million is served by fluoridated water, either natural or adjusted. Moreover, close to three-fifths (58 percent) of the 177.0 million persons on public water systems receive fluoridated water.

Communities with fluoridated water supplies numbered 9,425 at the end of 1975; in 2,630 communities fluoride is present naturally in the water supply, and in 6,795 the fluoride content is adjusted to optimum concentration by local authorities. As might be expected, fluoridation is most prevalent in the larger communities; 70 percent of all cities of 100,000 or more have fluoridated water.

The extent of fluoridation varies greatly among the individual States. Four States--Illinois, Colorado, Connecticut, and Michigan--each have more than 75 percent of their total population on fluoridated water. In another 11 States, over 60 percent of the population is supplied with water containing an adequate amount of fluoride. At the other extreme are 11 States in which 25 percent or less of the population is served by fluoridation, including three States with less than 10 percent.

Table I-1
NUMBER OF DECAYED, MISSING, AND FILLED (DMF) PERMANENT TEETH PER PERSON, BY SEX, COLOR, AND AGE GROUP: 1971-1974

Sex, color, and age group	Total DMF teeth	Decayed teeth	Missing teeth	Filled teeth
All persons, ages 6-74	14.1	1.3	6.3	6.5
Sex				
Male	13.4	1.4	5.8	6.2
Female	14.8	1.3	6.7	6.8
Color				
White	13.3	1.2	5.4	6.7
Black	10.2	2.3	6.1	1.8
Age groups				
6-11 years 1/	1.7	0.7	0.2	0.8
12-17 years	6.4	1.8	0.9	3.7
18-24 years	11.4	2.1	2.4	6.9
25-44 years	17.7	1.5	7.2	9.0
45-64 years	20.4	0.9	11.4	8.1
65-74 years	22.2	0.6	15.2	6.4

1/ For children in age group 6-11, the data refer to permanent teeth only. For primary teeth, total def is 2.7 and comprises: decayed (d), 1.2; extraction indicated (e), 0.3; and filled (f), 1.2.

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Provisional data, unpublished.

Table I-2
PERCENT DISTRIBUTION OF ADULTS, BY STATUS OF PERIODONTAL DISEASE, ACCORDING TO SEX AND AGE GROUP: 1971-1974

Sex and age group	Total	Without periodontal disease	With periodontal disease		
			Total	Without pockets	With pockets
All persons, ages 18-74	100.0	51.4	48.6	25.2	23.4
Sex					
Male	100.0	45.3	54.7	28.1	26.6
Female	100.0	57.1	42.9	22.5	20.4
Age group					
18-24 years	100.0	59.7	40.3	33.8	6.5
25-44 years	100.0	54.3	45.7	26.1	19.6
45-64 years	100.0	43.5	56.5	19.7	36.8
65-74 years	100.0	36.7	63.3	13.5	49.8

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Provisional data, unpublished.

Table I-3
PERCENT DISTRIBUTION OF ADULTS BY NUMBER OF EDENTULOUS ARCHES, ACCORDING TO SEX AND AGE GROUP: 1971-1974

Sex and age group	Total	No edentulous arch	One arch edentulous	Both arches edentulous
All persons, ages 18-74	100.0	76.1	9.2	14.7
Sex				
Male	100.0	78.7	8.0	13.3
Female	100.0	74.0	10.2	15.8
Age groups 1/				
18-44 years	100.0	90.3	5.6	4.1
45-64 years	100.0	62.7	13.5	23.8
65-74 years	100.0	39.1	15.4	45.5

1/ In the age group from 6 to 17 years, there is virtually no edentulousness; only 0.1 percent have one edentulous arch and another 0.1 percent have both arches edentulous.

SOURCE: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. Provisional data, unpublished.

Table I-4

PERCENT OF POPULATION SERVED WITH ADJUSTED AND NATURAL FLUORIDATED WATER SUPPLIES, BY STATE: DECEMBER 31, 1975

State	Total population 1975 (thousands)	Population served with fluoridated water (thousands)	Percent of total population served with fluoridated water	Rank
United States 1/	209,843	102,947	49.1	
Alabama	3,546	1,119	31.6	38
Alaska	330	156	47.3	24
Arizona	2,073	649	31.3	39
Arkansas	2,035	781	38.4	34
California	20,652	4,557	22.1	43
Colorado	2,468	2,069	83.8	3
Connecticut	3,080	2,448	79.5	4
Delaware	573	227	39.6	33
District of Columbia	734	734	100.0	1
Florida	7,745	2,774	35.8	36
Georgia	4,818	1,997	41.4	29
Hawaii	841	55	6.5	49
Idaho	776	261	33.6	37
Illinois	11,176	9,638	86.2	2
Indiana	5,304	3,247	61.2	16
Iowa	2,863	1,773	61.9	14
Kansas	2,264	1,167	51.5	19
Kentucky	3,328	1,699	51.1	21
Louisiana	3,746	870	23.2	42
Maine	1,039	422	40.6	31
Maryland	4,074	2,777	68.2	7
Massachusetts	5,799	1,253	21.6	44
Michigan	9,061	6,899	76.1	5
Minnesota	3,890	2,785	71.6	6
Mississippi	2,317	574	24.8	41
Missouri	4,768	2,006	42.1	28
Montana	730	193	26.7	40
Nebraska	1,533	703	45.9	26
Nevada	551	17	3.1	50
New Hampshire	794	106	13.3	47
New Jersey	7,325	1,574	21.5	45
New Mexico	1,099	702	63.9	11
New York	18,214	12,055	66.2	10
North Carolina	5,302	2,409	45.4	27
North Dakota	635	323	50.9	22
Ohio	10,743	4,457	41.5	30
Oklahoma	2,669	1,690	63.3	12
Oregon	2,219	239	10.8	48
Pennsylvania	11,862	5,485	46.2	25
Rhode Island	967	646	66.8	9
South Carolina	2,724	1,439	52.8	18
South Dakota	682	420	61.6	15
Tennessee	4,095	2,743	67.0	8
Texas	11,828	6,944	58.7	17
Utah	1,150	28	2.4	51
Vermont	466	173	37.1	35
Virginia	4,844	2,481	51.2	20
Washington	3,431	1,368	39.9	32
West Virginia	1,788	908	50.8	23
Wisconsin	4,539	2,828	62.3	13
Wyoming	353	73	21.2	46

1/ Omitted are data for Puerto Rico and the Virgin Islands which are included in the totals in the source document.

SOURCE: U.S. Department of Health, Education, and Welfare, Center for Disease Control, Dental Disease Prevention Activity. Fluoridation Census, 1975. April 1977.

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